Engineering News, October 26, 1961

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No. 4 October 26, 1961

ENGINEERING NEWS

THE NEWSPAPER OF INDUSTRY ● A HEYWOOD PUBLICATION

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INDUSTRIAL TOOL with the New 'Blue' Blade by SURFORM
Blade an Invention of Firth Brown Tools Ltd. 144 SU

Every Thursday, Price 4d

Meteorologists may control future office heating

SAVE POWER DRIVE BEGINS

Scientists' aim is to cut peak loading of electricity

ECONOMIC use of electricity by heating a building to match tomorrow's weather is the aim of a three-year programme now starting at the Electrical Research Association (ERA) in Leatherhead.

Electricity, even off-peak, is precious and it is important to use it as efficiently as possible. Any economies which can be made will not only conserve the general supply but will also heat factories and offices more cheaply for the same comfort.

To achieve this economy with present thermostats it is necessary to have a local weather forecast and then relate its effect on the materials and layout of a specific building.

In order to obtain comprehensive data for all seasons the E.R.A. are erecting a five-storey building of five rooms using different materials and insulations.

The first part of the experiment is aimed at finding the amounts of electricity needed to maintain an even heat in all weathers.

Weather watch

This will involve observations on every weather characteristic, such as wind strength and heat dissipation.

Getting this basic pattern is expected to take two winters. Then off-peak heating will be used and normal disturbances introduced.

Continued on back page

ATOM SHIP COSTS 'TOO HIGH'

THE cost of atomic engines for ships must be halved and their fuel bills cut by a third before they can compete with steam turbines.

Sir William Cook, of the United Kingdom Atomic Energy Authority, told this to guests at the James Watt dinner of the Institution of Engineers and Shipbuilders in Scotland. Reactors being studied give promise of lower costs, but this promise remains to be demonstrated.

State finance

The capital cost of such non-nuclear parts as shielding and collision protection must be cut to get the price of nuclear propulsion low enough.

He saw no prospect of quick results and hoped the Government might finance such development. The application of nuclear power to large merchant ships ought not to be impossible.

Mr. Walker, Vice President of the Institution, said that the industry was waiting for a clear lead from the Government. After four years of waiting, patience was wearing thin. Shipbuilders were wondering whether they should disperse their nuclear teams.

In this issue

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Liquid nitrogen for contraction assembly
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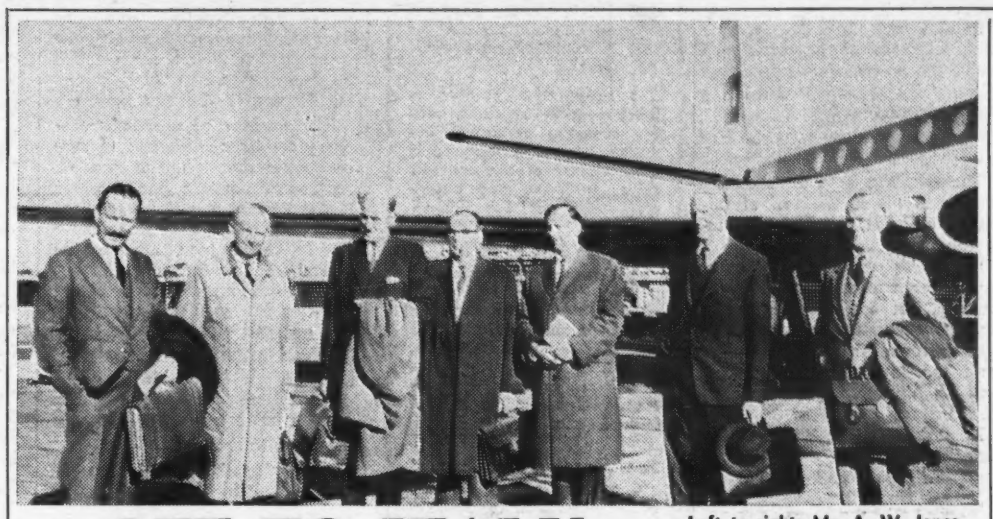

OFF TO ITALY

Left to right: Mr. A. W. Jones, president of SIMA; Mr. J. E. C. Bailey, chairman Baird & Tatlock (London) Ltd.; Mr. G. F. Sturrock, director Kelvin & Hughes Ltd.; Mr. R. W. Perry, director Isotope Developments Ltd.; Major W. Logan, director Avo Ltd.; Dr. F. Hamill, general export manager Hilger & Watts Ltd.; Captain R. A. Villiers, director of SIMA.

EIGHT representatives of the Scientific Instrument Manufacturer's Association of Great Britain are now visiting Rome, Milan, Florence, Naples and Turin, with the purpose of increasing the exports of British scientific instruments to Italy.

The delegation includes Mr. A. W. Jones, who is president of SIMA and also chairman and managing director of Fleming Radio (Developments) Ltd.

At a press conference held on Monday Mr. Jones said they would be "fact finding and not selling".

The main object of their visit was the creation of a true image of their industry and to put it in perspective with their main competitors who have gained much ground in the rapidly-developing Italian market in recent years.

Last year, said Mr. Jones, only 8 per cent of the instruments imported into Italy came from the U.K. compared with 35 per cent from Western Germany and 21 per cent from the U.S.A.

The trade mission will probably be followed up by active individual sales efforts by all SIMA members to rectify the prevailing situation.

In their task of promoting "a true image" the delegates, will, collect information on the instruments needs of Italian industries.

Tap rakes measured at CSIRO

AN accurate and speedy optical method for checking rake and relief angles of threading taps has been developed by Mr. K. Edensor, of the Commonwealth Scientific & Industrial Research Organisation, Division of Metrology, Sydney, Australia.

The tap is viewed from the end through a microscope while a very narrow beam of light is projected on to one side of it.

Measuring plates

The microscope also has provision for viewing two glass plates. One of these has on it two fine dotted lines at right angles. The other has a pair of unbroken lines at right angles, and a pattern of concentric circles.

The two plates can be adjusted readily to the cutting edge of the tap. The rake angle, which is the angle between the horizontal dotted line and the solid line, can be read from a scale.

Anti-gale dome

The English Electric Co.'s reinforced-plastics structure at Freckleton, Lancs., is the largest yet made in Europe.

DESIGNED to withstand hurricane force winds and below zero temperatures, this reinforced plastic dome will be used for protecting defence radar equipment.

The dome consists of 300 fabricated panels bolted together to form a structure nearly 70ft. diameter and 50ft. high. English Electric have just completed and erected the dome for test at Freckleton, Lancs. Their reinforced plastics division spent several years on research for this project.

The randome is made to exacting requirements, demanding special materials and processes for extreme weather conditions.

GEC is to hive off engineering group

A NEW company, G.E.C. (Engineering) Ltd., has been formed to take over and develop the Engineering activities of The General Electric Co.

The manufacturing resources of the new company comprise the Electrical Engineering Works at Witton, Birmingham, and the Mechanical Engineering Works at Erith, Kent.

Our Financial Editor writes: The General Electric Co. thus carries one stage further its reconstruction programme. The company is gradually becoming a non-trading holding company responsible for numerous semi-autonomous subsidiaries.

The G.E.C. management intend by their reconstruction to form a series of companies whose general development will be more swiftly responsive to individual management decisions.

It is intended that the programme should be completed by the end of the financial year, in March 1962.

AIRCRAFT UNION TO DISCUSS POLICY

BECAUSE of the current employment situation in the British aircraft industry the Association of Supervisory Staffs, Executives, and Technicians will hold a special meeting in London on Saturday, at St. Pancras Town Hall, N.W.1., at 2 p.m.

The conference will be attended by representatives employed as technicians in the major airframe and aero-engine plants throughout the country.

At the meeting it is intended to elaborate on the association's policy which is to press the government to support the building of a supersonic airline.

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ENGINEERING NEWS
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Requiring the minimum of attention or maintenance, the Tangye automatic oil-fired heater is a most efficient and economical method of space heating. Three safety devices are incorporated which automatically come into operation in the event of either flame, electricity or fuel failure. Automatic re-start is by spark ignition on the restoration of supply. A thermostat is fitted and can be set to provide just the amount of heating required.
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Letters to the Editor

SOMEONE STRONG IS NEEDED TO CUT STATE EXPENDITURE

IT is interesting to read that pressure is being brought on the government within its ranks to take a positive stand to reduce its own expenditure.

The overall effect would be a fiscal and welcome change in taxation, and while we are frequently told that most chancellors have tried to be specific, nothing has come of it because critics strongly oppose the protection of sectional interests.

In that way the game of hide and seek goes on relentlessly to shelve the problem of expenditure to the point where it is still rising in extravagance.

Strength needed

The question is who is strong enough to pierce the veil of obscurity of what constitutes necessity and extravagance!

It is highly questionable whether any government could succeed voluntarily, but one day it may be compelled involuntarily to do so when revenue from industry has sunk too low, due to excessive taxation, directly due to government extravagance.

Nemesis will assuredly bring vengeance to bear on a system which is crippling British industrial economy!

FRANCIS B. WILLMOTT.
Forward Works,
River Street,
Birmingham, 5.

All eyes on these pioneers

I WAS interested to note the reference in your first issue to the occupational hygiene unit being set up in Manchester.

A similar unit was set up some 10 years ago by the Slough Industrial Health Service, for the benefit of local industry, and for the past four years its services have been made available to industry throughout the country.

The unit has now become independent, and like the Manchester unit, is receiving a grant from the Nuffield Foundation during a period of further development.

The extent to which further facilities will become available here, will depend on the use which industry makes of the pioneer units at Manchester and Slough.

D. E. HICKISH.
The Occupational Hygiene Centre,
100 Farnham Road,
Slough,
Bucks.

BRITAIN CAN REGAIN GREATNESS

BRITISH industry does not need Union control as Mr. Willmott suggests (Oct. 12, 1961).

I agree that nothing is fundamentally at fault with the economy of British industry. What is required is a resurgence of the dynamic drive, initiative and enterprise that put the GREAT into Great Britain towards the end of last century.

Let us have more dynamic, pulsating leadership with creative ideas, to tap the latent purpose and skill of the British working man, who is only too well aware of where his money comes from and the high cost of strikes.

J. A. CONWAY
Stephenson Engineering Laboratories,
King's College,
Claremont Road,
Newcastle 2

TOOLMAKERS UNITE!

The skilled man has been ignored for 30 years by trade unions

MAY I first of all congratulate all concerned with the publication of Engineering News. In spite of all the magazines and publications about engineering which reach us, and have to be scanned, I find that your paper is more than just another, and it has given me enjoyment in reading the first two numbers.

In regard to the letter from Mr. R. G. Lister in your publication of October 12, the metal work trade is not the only one suffering from the lack of skilled men. We in the contract toolmaking trade are faced with the same problem.

The skilled toolmaker has been ignored for the past 30 years by the trade unions, who built their original organisations on the skilled tradesman. The employers have also done nothing to help the situation, but their hands are tied by being fettered to the Engineering Employers' Association.

The various governments over the years have disdained to face up to the situation, and now we are entering into a period where the skilled man will be required more and more, and what do we find? Good men are leaving skilled work to earn more money as machine minders and button pushers.

Not paid enough

The skilled trades are not paid enough in comparison with the unskilled worker and it is no good arguing that the skilled man has a more interesting job, and should require less money. Today, the weight of the wage packet is what counts, especially in his home. Without the skill of the craftsman, industry will grind to a stop.

The answer is for the skilled man to join a union for skilled men only, one that will look after his interests and elevate him to a position in the wage group above the unskilled worker.

Own association

The employers of skilled labour, especially the toolmakers, should form their own association for contracting wages and conditions with such a union of skilled men. The whole engineering industry must be prepared to pay higher prices for their tools so that the skilled man can obtain his rightful position in industry.

The alternative is further losses in the ranks of skill.

It is no good having all the scientific technicians we are training today if we do not have the skilled workmen to put their ideas into practice.

P. J. MOSEDALE
Holt & Mosedale, Ltd.,
Old Hill,
Staffordshire.

'We MUST surrender sovereignty to join the Common Market'

MR. Peter Thorneycroft, Minister of Civil Aviation, stated recently that it was "nonsense" to believe that, in joining the European Economic Community, Britain would be handing over her sovereignty to the European Commission. He added that every time this country signed a treaty we handed over some sovereignty.

One of the main attributes of sovereignty is the power to make treaties and, in accordance with their terms, to end them.

We have signed, since the war, three treaties of great importance—G.A.T.T., E.F.T.A. and N.A.T.O. From these we can withdraw after due notice.

As we can withdraw we have not surrendered any sovereignty but have merely delegated our authority for a period and for certain purposes.

No right

The Treaty of Rome is different; there is no right of withdrawal. Were we to enter, we should never again be able to conclude a tariff or trade agreement with anyone, anywhere; such agreements could be made over our heads by the European Commission.

Decisions of Her Majesty's judges in many vital matters could be overruled. In due course, employers could import foreign work people as and when they pleased, who could remain in the country at will thereafter.

These are a few of the conditions we should have to accept. We should thus have surrendered sovereignty and become a subject nation in a very wide field in which the Commission would be an authority for ever over the Queen in Parliament.

The public should know these facts.

W. A. WELLS
Commonwealth Industries Association,
96/100 New Cavendish Street,
London, W.1.

FIGURES CAN BE WRONG

CARE must be taken to state what "percentages" means and, it seems, more use made of "times greater" (or less) than at the moment.

(A) Increase of 100 per cent = double.

(B) Increase of 300 per cent usually is taken to be three times, but according to A it means four times.

Year A has an increase of 25 per cent. $100 + \frac{1}{4}$ of $100 = 125$.

Year B has a decrease of 20 per cent. $125 - 1/5$ of $125 = 100$.

On page 3 issue 3 "Wear reduced": does 75 per cent decrease of wear, mean wear is reduced to $\frac{1}{4}$ of its original value?

W. J. MINTON, A.M.I.E.E.
67 Weald Road,
Brentwood,
Essex.

Short life?

A NEW machine or piece of production plant can be written off in a few years. In view of the growing importance of appearance in design and the demands of foreign buyers who like to have the latest model (even when existing plant still works well) would it not be wise for our machinery manufacturers to design cheaper products for a shorter life? **B. N. LONG**
Bilston,
Staffs.

The new Richardsons Westgarth Maxecon* three-pass, wet back shell boilers have..... a large steam release area, giving high-purity steam.... a large water volume for handling fluctuating loads.... and ample room for internal examination.

Steam Dryness Fraction is 0.97+, and Steam Purity 1.75 p.p.m. at full rating with boiler water T.D.S. 2250 p.p.m.

The boiler's flexibility is such that during development tests the load was increased from zero to M.C.R. in two minutes without any significant drop in boiler pressure.

All three passes are well submerged, the two combustion chambers being set at an angle to allow the third pass to run between them. This design leaves ample room for internal inspection, yet the whole boiler takes up only three quarters of the floor space needed by an equivalent dry back boiler. *Further particulars available on request.*

Thermal Efficiency: High thermal efficiency over a wide range of loads.
Pressure: Up to 250 p.s.i.g.
Capacities: 11,000 lb/hr. to 23,000 lb/hr. (Designs to extend this range are under development).

*Regd. Trade Mark. (Richardsons, Westgarth & Company Limited.)

Richardsons Westgarth (Hartlepool) Ltd.

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RW99

MORE ON LEAD SCREWS

Maudsley was first

I REFER to W. Mannheim's letter in the first edition concerning the invention of the lead screw on the lathe.

Maudsley was the first engineer to produce one. He used the following method to obtain a lathe lead screw of relatively high accuracy even at present-day standards.

He first wrapped waxed string around a bar at the correct pitch and cut between the string with a hammer and chisel to form a rough thread.

Having installed this crude lead screw in his lathe he then packed a brass box with elder pith and used this as the conventional half-nut.

As the box covered 6-7 threads on this original hand cut lead-screw, when he commenced to cut his second lead screw using the first and pith-packed box he obtained a lead screw 6-7 times more accurate than his first.

Maudsley then repeated this operation until he had produced 10 lead-screws, the final one being of fair accuracy.

R. MORRIS.
Dunchurch Lodge,
Dunchurch,
Rugby.

ALMOST 150 YEARS AGO

I DO not know how the first lead screw was made, but when my grandfather was serving his apprenticeship, some 150 years ago, he had to make a lead screw several inches in diameter and one inch pitch with castle thread.

This was drawn on paper which was pasted round the shaft and then cut out by hand with hammer and chisel.

DONALD MACDONALD.
Bar Knight Model Engineering Company,
57 Bishop Street,
Glasgow, C.3.

THE EDITOR

. . . welcomes letters on any subject. Post them to Engineering News, Drury House, Russell Street, London, W.C.2.

Engineering in the dairy

SIMPLEST IS BEST AT ROYAL SHOW

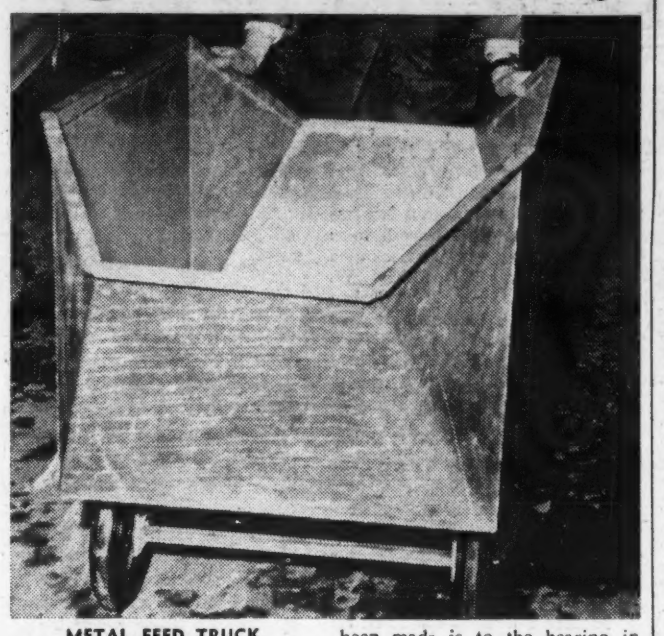
ENGINEERING plays its useful role in the many applications to dairy produce, poultry and animal raising. Possibly the most interesting new developments in this field are among the simplest exhibits on view at the Royal Dairy Show, Olympia, which closes tomorrow.

A highly manoeuvrable all-metal feed truck, manufactured and exhibited by Clares (Wells) of Wells, Somerset, permits loading sacks at ground level without the operator lifting.

The shape of the bin enables it to be stood on end for complete emptying and provides hand holds within the outer edge.

A high pressure washing machine which can be used in conjunction with a tractor's power take-off operates at a pressure of 400 p.s.i.

Pressure is maintained up to 150ft. from the pump. E. Allman & Co. of Chichester, Sussex, are showing this machine, designed for cleaning, which when fitted with a lance and spray nozzle will push dirt along the floor.



METAL FEED TRUCK
Saves lifting

Gascoigne - Crowther of Reading, Berkshire, have reduced the price of their egg cleaning machine from £21 to £15.

This has been achieved by redesigning. One change that has been made is to the bearing in the base of the machine.

This was previously nylon, but due to slight swelling in the bearing resulting from dampness this has been replaced by steel.

KELVIN HUGHES PIONEER DIES

ONE of the last remaining links with Lord Kelvin has been broken by the death at Greywell, Hampshire, on October 18 of Mr. F. A. King.

Mr. King retired from Kelvin & Hughes, Ltd., in 1955 after 55 years of service.

Born in London in 1880, Mr. King qualified as an electrical engineer, and in 1900 became an assistant in the private laboratory of Dr. J. T. Bottomley, a nephew of Lord Kelvin. During this period he was frequently in contact with Lord Kelvin, whose death in 1907 was followed by the formation of the new company Kelvin, Bottomley and Baird.

He became managing director of Kelvin, Bottomley and Baird in 1935, and with the amalgamation of this company with Henry Hughes, Ltd., Mr. King became joint managing director with Mr. G. B. G. Potter of the new company Kelvin and Hughes, Ltd.

WIRE FEED RATE INSTRUMENT ELIMINATES SLIP

A MONITORING instrument which measures the rate at which wire is fed to a given point in an industrial process has been developed and constructed by the British Welding Research Association, Abington Hall, Cambridge.

The usual method of determining wire feed speed is by direct tachometer reference to the speed of the drive rolls but this is susceptible to inaccuracy as the result of wire slip.

In the new instrument the wire itself is made to drive a milled spindle to the end of which is attached a disc having regularly spaced slots around its periphery.

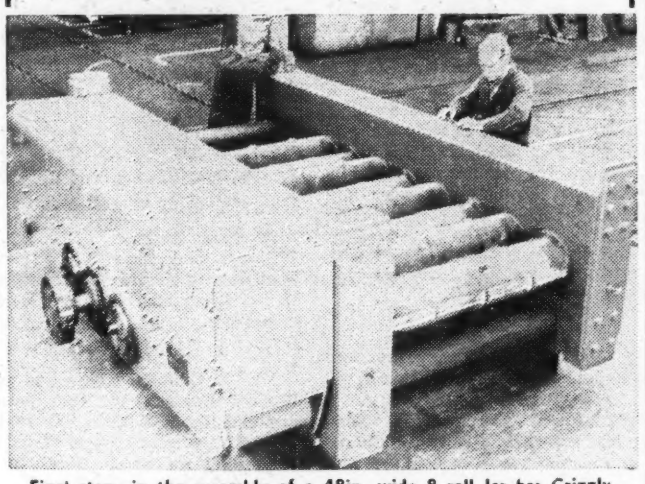
The disc, in turn, is positioned between a small lamp and a photocell. As the disc rotates the light beam is interrupted and the electrical resistance of the cell alternates accordingly, the cycles taking place 72 times with each revolution of the driving spindle.

The change in electrical resistance applied to a transistorised amplifying circuit, produces a square-wave output signal which is fed into an electronic frequency meter coupled to a direct reading "inches per minute" scale.

The monitor will handle wire up to ¼in. diameter.

For maximum accuracy the instrument is calibrated for 0-30, 0-300 and 0-600 in./min., the entire scale being used in each range which is selected by means of a switch.

GEC MAKE JAR-BAR GRIZZLY FEEDERS



Final stage in the assembly of a 48in. wide 8-roll Jar-bar Grizzly Feeder in the Erith works of G.E.C.

A new range of jar-bar grizzly feeders is now in production at the Fraser and Chalmers engineering works of the General Electric Co.

These feeders, which are the first of their type to be manufactured in Britain, are particularly suitable for removing clay or sticky fines from ore or stone before it enters a primary crushing plant.

Two types of machine are available, one for standard duty and the other for heavy duty, and both types can be fitted with 8, 10, 12 or 14 rolls. Heavy-duty machines can be provided having widths of 48in. 60in. or 72in. with capacities up to 5,000 tons per hour.

Standard-duty machines are available in widths of 24in., 36in., or 48in. with capacities up to 2,000 tons per hour.

The new G.E.C. jar-bar grizzly feeder employs elliptically-shaped rolls. The rolls are arranged with the major axes of adjacent bars at right angles. Forward feed is obtained with the machine mounted horizontally or even inclined upwards. Skidding of the material over the rolls is thus reduced to a minimum.

A further advantage is the ability of the feeder to spread the fines load evenly over the conveyor belt.

This is possible because the discharge setting can be varied for each pair of rolls, so that a graduated discharge size, say from 1½in. up to 10in., may be obtained on one machine.

PLA orders £400,000 Dutch crane

THE Port of London Authority has ordered a floating, self-propelling and rotating crane worth £400,000 from the Dutch combine Holland Cranes Ltd.

The crane can lift 60 tons at a radius of 90ft. and 20 tons at 100ft. radius.

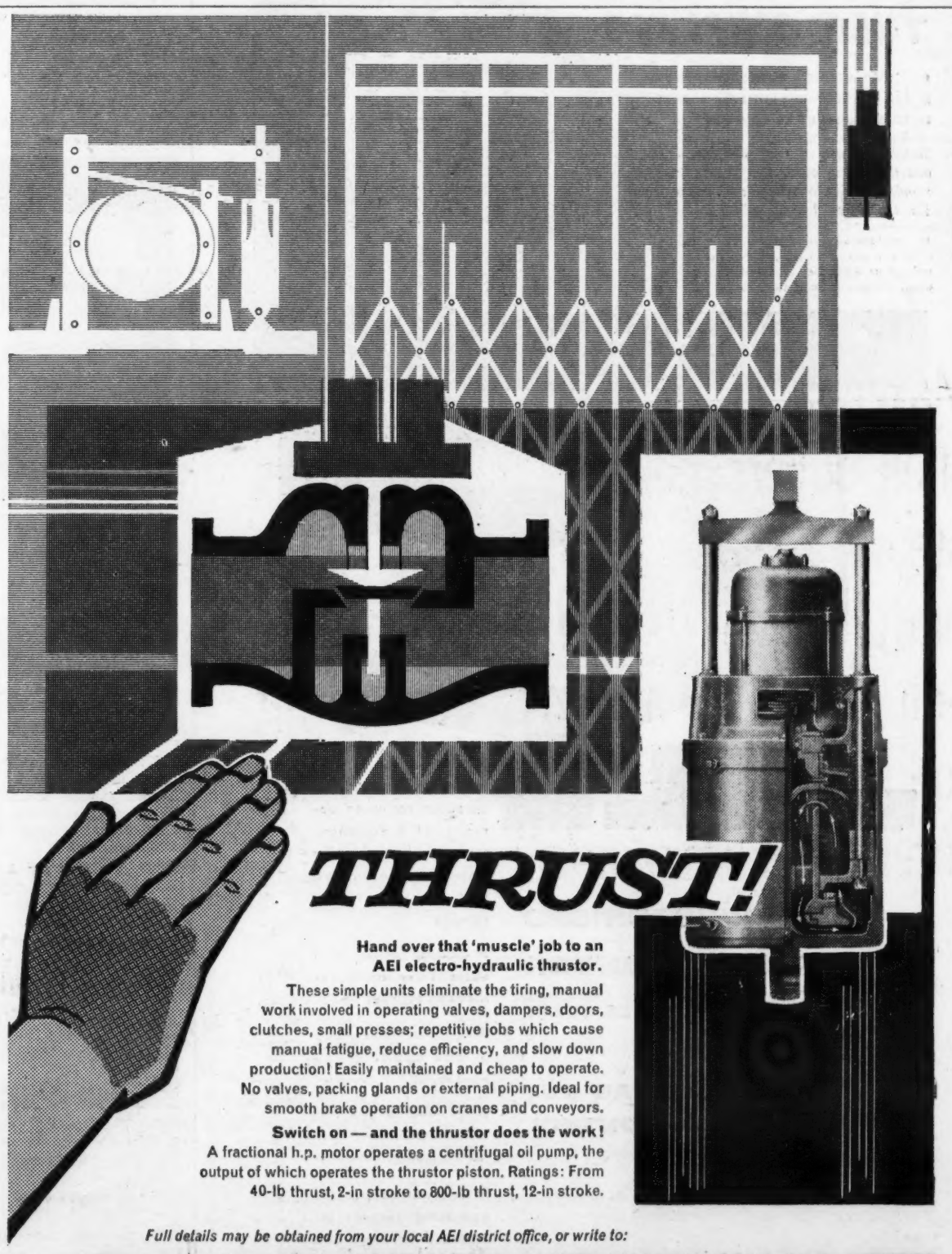
Two diesel engines, each of 750 hp are used and the craft, which is 179ft. long by 57ft. wide, has a speed of 9 knots.

Holland Cranes is a combine of two leading Dutch shipyards: Gusto shipyard at Schierdam, near Rotterdam, and Vershure shipyard near Amsterdam, and the major Dutch engineering works of Conrad Stork Engineering at Haarlam.

BEA GET EMIDEC

THE most powerful Emidec 1100 computer yet made has been delivered to British European Airways at Ruislip to handle the airline's unusually complex accounting system and statistical analysis.

This is the eleventh Emidec 1100 to be delivered to a customer.


THRUST!
Hand over that 'muscle' job to an AEI electro-hydraulic thrustor.
These simple units eliminate the tiring, manual work involved in operating valves, dampers, doors, clutches, small presses; repetitive jobs which cause manual fatigue, reduce efficiency, and slow down production! Easily maintained and cheap to operate. No valves, packing glands or external piping. Ideal for smooth brake operation on cranes and conveyors.
Switch on — and the thrustor does the work!
A fractional h.p. motor operates a centrifugal oil pump, the output of which operates the thrustor piston. Ratings: From 40-lb thrust, 2-in stroke to 800-lb thrust, 12-in stroke.
Full details may be obtained from your local AEI district office, or write to:
AEI
Associated Electrical Industries Limited
MOTOR AND CONTROL GEAR DIVISION, RUGBY, ENGLAND
A 5600

NEW DIRECTOR APPOINTED TO THE B.I.S.F.

A NUMBER of major appointments have been announced by the British Iron and Steel Federation.

Mr. E. W. Senior is to become the director of the Federation, and **Mr. J. B. Cowper** will be managing director of the British Iron and Steel Corporation Ltd., the industry's main central trading organisation, in addition to his present post of financial director of the Federation.

Mr. J. Driscoll is to be assistant director (economics), **Mr. L. J. Gollop,** assistant director (statistics), **Mr. B. S. Keeling,** assistant director (training), **Mr. A. H. Mortimer,** assistant director (commercial), and **Mr. K. Donohue** is to be the secretary of the Federation.

MR. E. W. SENIOR

PEOPLE in the NEWS

The Asquith Machine Tool Corporation Ltd. announce that **Mr. R. W. Asquith,** chairman, has been appointed to the newly created position of managing director of the corporation. He has resigned his position as managing director of William Asquith Ltd., but remains chairman of that company.

☆

The following changes are announced in the boards of the corporation's subsidiaries:

William Asquith Ltd.: **Mr. J. D. H. Horobin,** group financial director of the corporation, and **Mr. G. W. Wright,** group technical director, have been appointed joint managing directors. **Mr. H. Booth,** the secretary, has been appointed an additional director, **Mr. J. G. R. Woodvine** has resigned from the board following the transfer of the Shrewsbury works of William Asquith Ltd., to R. Woodvine and Son (Shrewsbury) Ltd., an Asquith subsidiary of which Mr. Woodvine is managing director.

Drummond Brothers Ltd.: **Mr. G. E. Hickman** is to retire from the chairmanship and joint managing directorship on September 30, 1962, when he will have completed 60 years service with the company. **Mr. Robert W. Asquith** and **Mr. C. J. Casben** have been nominated to become chairman and managing director respectively, with effect from October 1, 1962. In the meantime, Mr. Asquith becomes deputy chairman, and Mr. Casben joint managing director. **Mr. A. D. George** and **Mr. W. G. Hunt** have been appointed additional directors.

Drummond-Asquith Ltd.: **Mr. J. M. Stewart,** the secretary, has been appointed an additional director.

Modern Foundries Ltd.: **Mr. H. Booth,** the secretary, has been appointed an additional director.

Asquith Electric (Colne), Ltd: **Mr. N. Baker,** the secretary, has been appointed an additional director.

R. Woodvine and Son (Shrewsbury), Ltd.: **Mr. N. Baker** has been appointed an additional director.

☆

The President of the South Wales Institute of Engineers, **Mr. J. Selwyn Caswell,** has recently

MR. J. S. CASWELL

retired from the post of senior lecturer in mechanical engineering at the University College of Swansea.

☆

The death occurred suddenly on October 18 at the age of 50 of **Mr. Jack Hardcastle Dixon,** secretary of David Brown and Sons (Huddersfield), Ltd., gear manufacturers, Huddersfield.

☆

The power transformer department of The British Electric Transformer Co. Ltd., an associate company of Crompton Parkinson Ltd., have appointed **Mr. A. J. Wakeling** as chief designer.

Mr. Wakeling started at Hayes in 1941 as an engineering apprentice and received a very thorough training at the Hayes works. He

MR. A. J. WAKELING

joined the staff of the transformer engineering department as a senior assistant transformer design engineer and was appointed a C.P. management trainee in 1959. He made extensive tours of South Africa in 1955 and Australia in 1957 as a technical sales representative.

☆

Clifford Allin (Engineering), Ltd., Frome Top, Minchinhampton, Stroud, Gloucestershire, have been appointed sole agents by

MR. C. W. ALLIN

Joseph Rhodes and Sons Ltd., Wakefield, for Devon, Cornwall, Somerset, Dorset, Gloucestershire and Hertfordshire. The company was recently founded by **Mr. C. W. Allin** and will serve technical sales for all Rhodes shears, presses and metal-working machinery.

Mr. C. W. Allin was formerly managing director of Redler Conveyors Ltd., and is well known in engineering circles, particularly in the south west.

Mr. R. Scholey, works manager (flat products) at The United Steel Companies' Steel, Peech & Tozer branch, has assumed responsibility for the Templeborough bar mill and the 10in. and 14in. mills in addition to the flat products departments. His designation is now works manager (rerolling mills).

☆

Mr. J. C. Gladman has been appointed manager of the computer engineering department, A.E.I. Electronic Apparatus Division, Trafford Park. He joined Metropolitan-Vickers Electrical Co. Ltd. in 1948 and became assistant chief engineer of the computer department in May 1959. Two months later, on the formation of the A.E.I. Electronic Apparatus Division, he was appointed assistant manager, computer engineering department.

Mr. Gladman has visited America three times over the past five years to study work there on computers. During the war, which interrupted his studies, he served with the Royal Corps of Signals in India, Burma and Java, reaching the rank of Major.

☆

Mr. R. E. Fischbacher has been appointed an assistant director of the British Scientific Instrument Research Association. He served for twelve years in the Admiralty Signal and Radar Establishment as a member of the R.N.S.S. before joining the British Scientific Instrument Research Association in 1957 to become head of the electronics department.

☆

Mr. F. D. M. Gamble has been elected president for 1961/62 of the Diesel Engineers and Users Association.

He was formerly a member of the executive committee of B.I.C.E.M.A. and B.I.C.E.R.A. In 1946 he was appointed chief

MR. F. D. M. GAMBLE

mechanical engineer of Samuel Williams and Sons Ltd., being subsequently elected a director of that company and of its associated companies.

☆

Mr. J. Griffith, a director of Richard Dunstan Ltd., has been awarded the Still Medal for 1961 by D.E.U.A. for his paper "Diesel Propulsion for Small Vessels".

Coming EVENTS

THIS WEEK

Closes today

Industrial Equipment Exhibition, City Hall, Manchester.

International Motor Exhibition, Earls Court, London.

Operational Research Society, National Conference, Leamington Spa.

October 26-November 5

Los Angeles 39th International Automobile Show.

October 30-November 3

Symposium on Welding in Shipbuilding. Institute of Marine Engineers, London, E.C.3.

October 31-November 1

Conference on Engineering with Plastics. The Plastics Institute, 6 Mandeville Place, London, W.1.

October 31-November 2

10th Canadian National Packaging Exposition, Toronto.

November 3-4

Materials Handling Convention, Fourth, Connaught Rooms, Great Queen Street, London, W.C.2.

November 7-12

Sixth Meeting and Review of Automation and Instrumentation, Milan.

November 8-10

Testing in Electrical Engineering, Savoy Place, London, W.C.2.

November 10-18

43rd Scottish Motor Exhibition, Kelvin Hall, Glasgow.

November 13-16

Seventh Annual Conference on Magnetism and Magnetic Materials, Phoenix, Arizona.

November 13-16

National Maintenance Conference and Exhibition, Central Hall, Westminster, London.

November 13-18

International Factory Equipment Exhibition Earls Court, London.

November 13-18

Second Engineering Materials and Design Exhibition, Earls Court, London.

November 15-29

29th Building Exhibition, Olympia, London.

November 22-27

Fifth Conference and Exhibition on Automation and Instrumentation.

November 23

One-day conference of the British Institute of Management on "Efficiency in the office", the Connaught Rooms, London, W.C.1.

November 27-December 1

Fifth Congress and International Automation Exposition, New York.

January 3-13

8th National Boat Show, Earls Court, London.

January 8-12

International Heat Transfer Conference, The Institute of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, S.W.1.

January 9-11

Eighth National Symposium on Reliability and Quality Control. Washington, D.C.

January 29-February 2

Electrical Engineering Exposition, New York.

January 22-25, 1962

National Plant Maintenance and Engineering Show, Philadelphia. A.F.S. Castings Congress and Exposition and 29th International Foundry Congress, Detroit.

April 5-8

5th Annual British Motor Show, Queen Elizabeth Hotel, Montreal.

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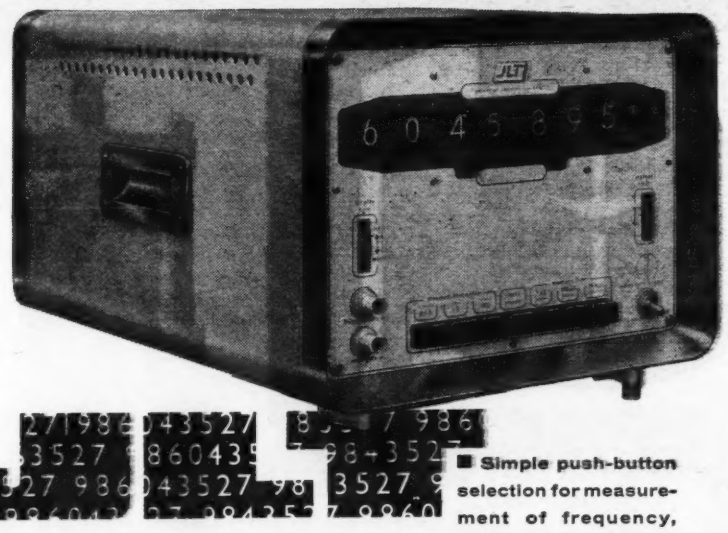

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FIRE! £44m Damage—and cost is still rising

NATIONAL PREVENTION WEEK STARTS IN FOUR DAYS TIME

Silhouettes emphasise the stark tragedy which carelessness can bring.

A GRIM picture provides ample justification for holding the first National Fire Prevention Week. It begins on October 30.

It is sponsored by the Fire Protection Association and the Royal Society for the Prevention of Accidents. There will be local displays backed by films on TV, and in cinemas.

A booklet called Fire Code will be available and follows the lines of the Highway Code.

Prior to 1959 the yearly loss through industrial fires was £25 million.

In 1959 and 1960 it rose to £44 million and 1961 is following a similar pattern. These figures do not cover huge production losses.

Some typical fire examples:

Car factory with an open-plan layout: fire started in tyre store; loss, £2¼ million.

Vegetable cannery: cigarette fired dust on cardboard boxes; loss, £150,000.

Metal sections factory: oxy-acetylene torch fired paraffin vapour; loss, £300,000.

Modern design trend towards open-plan factories increases the fire hazard and makes it necessary to compromise between freedom of layout and fire protection.

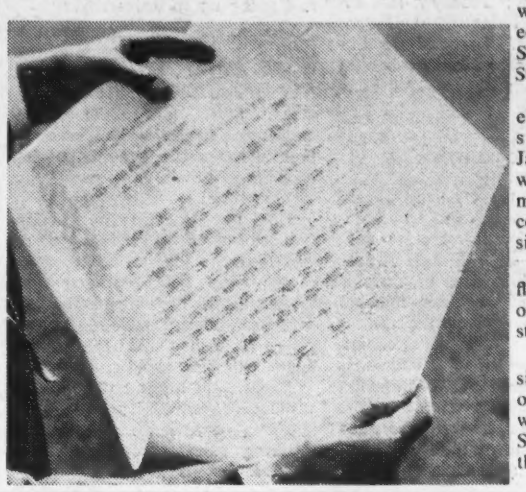
It is, therefore, important to pay special attention to building materials used. Fires tend to spread along roofs, and by dividing the trusses into pockets, gases and heat can be vented. Linings should be non-combustible.

Vertical supports, if not fire resistant, need some heat insulant. Steelwork collapses within ten minutes when in the fire area. Wherever possible, structural protection must be supplemented by other means.

Even in open-plan layouts some partitioning is possible and efforts should be made to put fire resistant barriers round heat treatment bays, stores and despatch areas.

With a thousand enthusiasms from start to finish

". . . Henry Simon became engaged on the construction of the new plant with a thousand enthusiasms from the start to the finish. It was due to their excellent technique and faithful endeavour that we succeeded in completing the plant."



FIRE destroyed the Osaka (Japan) flourmills of Maeda Sangyo Kaisha in May, 1960.

A new plant incorporating a complete new wheat-cleaning system of 5 tons per hour capacity was designed and equipped by Henry Simon of Cheadle Heath, Stockport.

Among equipment shipped to Japan for the new plant were 14 Simon roller mills, fitted with water cooling to the rolls, and six purifiers.

This month the new flourmills were officially opened and the plant started up.

An illuminated scroll signed by the president of Maeda Sangyo Kaisha was presented to Henry Simon. Part of this was the translation above.

Refrigeration goes non-mechanical

NON-MECHANICAL refrigeration methods based on the ability of certain coolants, notably liquid nitrogen and liquid carbon dioxide, to absorb tremendous quantities of heat when allowed to gasify are coming into increased use.

Promoted by the $500 million-a-year air-products industry the age-old principle promises to revolutionise the U.S. refrigeration industry.

A good estimate of frozen or refrigerated food waste annually is set at $4 billion.

Rapid cooling

A technique of rapid cooling with squirts of liquid nitrogen at −320°F is being used in door-to-door operations.

Linde Co. has made a limited number of fleet installations in some of the 200,000 trucks delivering ice-cream, meat, frozen food and other perishables.

Liquid carbon dioxide does not have the cooling capacity of liquid nitrogen but is favoured by two companies, Liquid Carbonic Div. of General Dynamics and Cardox Div. of Chemetron Corp. It does however enjoy a slight price advantage and the storage tanks are slung under the body of a truck rather than inside as in liquid-nitrogen systems.

Air Reduction Co. has been selling "blast cooling" with liquid carbon dioxide as an aid to conventional mechanical refrigeration.

The liquid-gas systems enjoy a 4-to-1 price advantage costing approximately $1,000 as compared to $4,500 for an average mechanical unit.

Reduction of high-speed moving parts promises an increase in life, since the liquid-gas system has only one moving part, a thermostat-controlled valve.

Liquifreeze Corp. offers proof of the system where an 8 cu. ft. container, well insulated, was still below zero when opened at the equator sixty days after initial cooling.

Other applications in freezing whole blood and in "cold stretching" of steel are under investigation.

One company reports using the cold-stretching process in which large stainless-steel vessels are cooled by liquid nitrogen and stretched by the expanding gas. An increase in tensile strength of 30 per cent is claimed.

BR DESIGN HYDRAULIC PILING MACHINE

A RAIL-MOUNTED, all hydraulic piling machine—first of its kind—has been designed and developed by the Chief Civil Engineer's Department of the North-Eastern Region of British Railways.

It saves time, and is more economical for laying lineside cables.

Modernisation of the railways has called for new cables for colour-lights signalling and telecommunications.

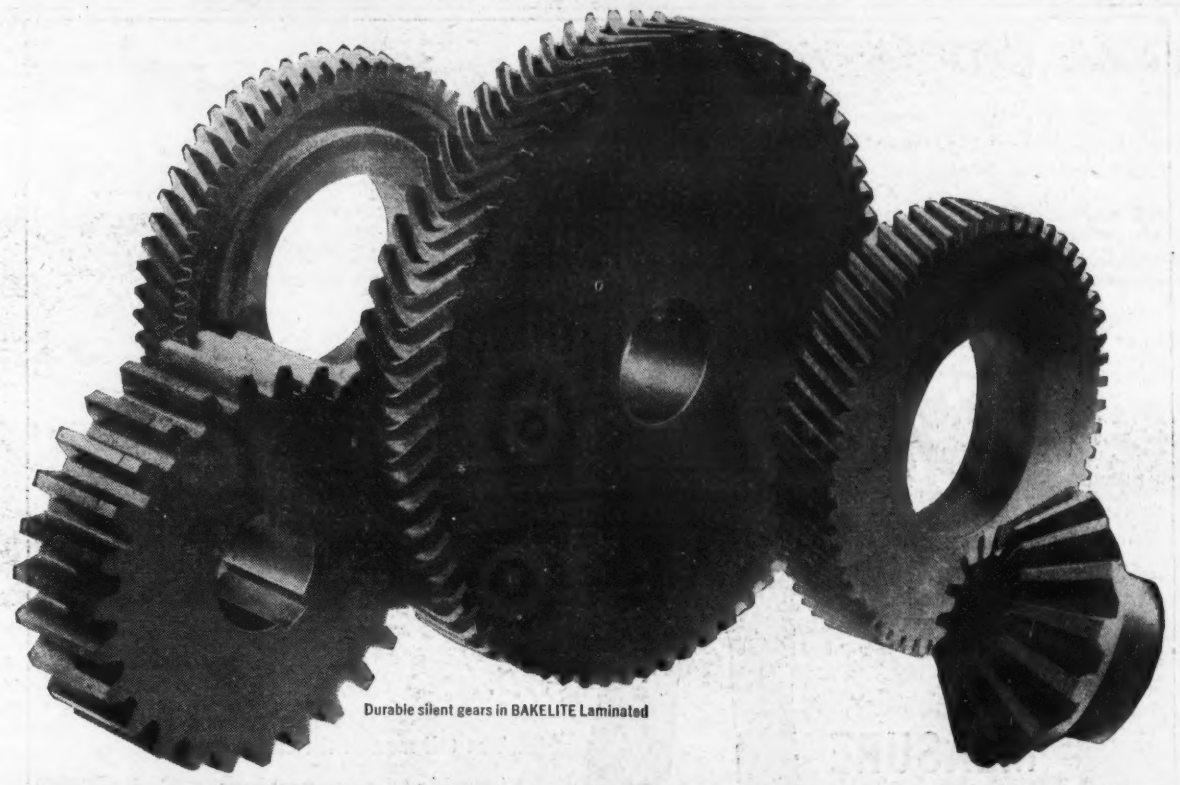
These, instead of being run underground — as they were formerly — are being housed in covered concrete troughs running parallel with the line.

Piles must be driven into embankment to support these. A 1-ton drop hammer, manually-operated from a railway wagon has been used for this in recent practice.

Consisting of a standard bolster bogie wagon, specially strengthened, the whole unit can be rotated through 90 degrees.

A second bolster wagon, on which are mounted two hydraulic cranes, and which carries the piles, works in conjunction with the main piling unit.

A diesel engine, which operates two large-capacity hydraulic pumps provides the requisite power, and the whole unit, which can be operated by a crew of eight, has an average production-capacity of 16-20 piles per hour.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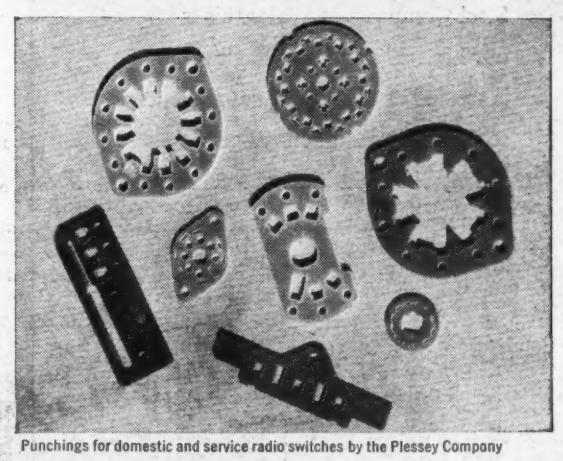
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POST-GRADUATE WORKS TRAINING

THE problem of attracting graduates into smaller firms with only limited facilities for practical training is one with which many are familiar.

The principal engineering institutions call for the individual to do a certain period of practical training before reaching corporate membership. Since the turnover of such firms is probably small, they can ill-afford to have any redundant labour, and it is imperative that they also have a proportion of the initially higher trained men.

The Scottish Electrical Training Scheme was set up in 1957 by eight electrical concerns in Scotland to provide the practical part of the training required by those who are going to make their careers as professional electrical engineers. The SETS course lasts for two years, as recommended by the Institution of Electrical Engineers towards qualifying, after graduation, for the corporate membership. Organisations taking part in the scheme are: The Belmos Company; Bruce Peebles and Company; The Harland Engineering Company; Honeywell Controls; James Kilpatrick and Son; the North of Scotland Hydro-Electric Board; Scottish Cables; and the South of Scotland Electricity Board.

Free choice

SETS uses the facilities offered by its members, and graduates usually spend a few months with each of the eight firms. At the end of the first year of training each man decides which member he wishes to join at the end of his training. After this choice, the remainder of the course is planned by SETS, in conjunction with the member concerned. The advantage of keeping an open mind up to the end of the first year is shown by the number of graduates who alter their initial choice.

Graduates' basic workshop training with member firms is divided into two parts; first under instructors in the member's apprentice school covering mechanical and electrical work, and the second on the shop floor or its equivalent in a generating station. There is also a short period of practical industrial training in the vacation between leaving school and going up to university.

The intake of graduates is limited to the requirements of the members, but Mr. J. E. C. McCandlish, the organising secretary of SETS, said at the annual conference in Edinburgh recently that the number would be increasing. This year was the largest intake with twenty-one graduates. Vocational training has been given to 106 men, which was also the highest figure, one-third being new entrants, and there were 18 pre-college trainees. The total number that have completed the course is thirty, but this figure will rise rapidly.

About eight times a year all the graduates assemble in Glasgow, to gain experience in public speaking and preparing set lectures.

EDUCATION and TRAINING

Bristol Siddeley award university scholarships

FOR the first time Bristol Siddeley Engines have sent four students to universities of their own choice on scholarships awarded by the company. This company may now be included with the other major firms who have been contributing in this way.

SILVER TROPHY

A SILVER trophy and premium awards have been presented to the City and Guilds of London Institute by the Electrical Engineers (A.S.E.E.) Exhibition Ltd. The Albert Brammer Trophy is a silver cup presented to perpetuate the name of the late General Secretary of the Association of Supervising Electrical Engineers.

The awards will go to outstanding candidates who take the Electrical Technicians' examinations and Endorsement Course.

The scholarships are open to any member of the firm or outsiders, and the selected four were chosen from 20 applicants. Bristol Siddeley has approximately 25,000 employees and over 1,000 trainees. Mr. R. E. Stevenson, chief education officer, said that he hoped with further publicity next year there would be more candidates coming forward and if the standard of entrants was high the number of scholarships would not necessarily be limited to four.

Short list

The scholarships are open to British university entrants intending to read science, engineering or mathematics. The awards are based on the results of the advanced level General Certificate of Education, and final selection is made after interviews with short-listed candidates.

The four successful candidates will spend the majority of their vacations training with Bristol Siddeley at their Bristol or Coventry factories. On obtaining degrees they will return to the company for two years on a post-graduate course with the aeronautical or power divisions.

The universities that have been chosen are Cambridge, Oxford, Bristol and Birmingham; the latter for a B.Sc. degree in metallurgy.

Students on the Continent

LAST week three chemical engineering students studying at the Bradford Institute of Technology left for the Continent to start a six months period with chemical firms as part of the Diploma of Technology course.

The four-year sandwich course is spent with alternating periods of six months in industry and at the college, but this is the first time that the industrial period has been spent on the Continent. It is also believed to be the first time that any college has sent Dip. Tech. course students abroad.

Study of German

One of the students has gone to a Dutch fertiliser firm near Rotterdam, another to a large metallurgical organisation in Duisburg, and the third to one of Germany's largest chemical works near Cologne.

A study of German is included in the General Studies part of the Dip. Tech. course

TEACHER RECRUITING PASSES TARGET

THE target figure set by a special committee in 1957 for 18,600 full-time technical college teachers by 1961 has been passed, according to a report published by the National Advisory Council on the Training and Supply of Teachers this week.

Calculating on observed trends in recent years, the Council observes that the present total of technical teachers will need to be increased to approximately 27,000 by 1963-64, and 37,000 by 1970. The report points out that no allowance is made for new developments in technical education. To achieve the 1970 figure and allowing for wastage, the annual recruiting rate must be increased to 3,600; in 1959-60 the total recruitment was 3,000. Calculating these figures has been a difficult task, plus accounting for the "bulge" years.

The report concluded: "The plans for university and technical college expansion give promise of a large rise in the supply of trained manpower during the decade. We hope that our estimates will be taken into account in determining both recruitment policy and the provision of training places in the future."

Intensive courses in mechanics

WITH nuclear energy in everybody's mind, attention may be diverted from the fact that there is still much to be learned by many people about certain less dramatic parts of engineering.

Vibration, for example, is a too-familiar phenomenon and although it has been studied intently for many years and although there are experts in every branch of it, there is still a need for mechanical engineers to be familiar with its fundamental character.

Study of mechanical vibration in this way is the subject of one of the five-week courses run by the Post-graduate Department of Applied Mechanics in the University of Sheffield.

Other courses are concerned with friction, lubrication and wear, with electronics used in mechanical engineering research, with experimental stress determination, with servo-mechanisms, automatic controls, and gear design.

Shorter courses are given on analogue computing methods, failure analysis, corrosion and fatigue, fine measurement, noise, hydraulic control of machines, plasticity and gear-loading.

The entry qualification is education to approximately the standard of a first degree and holders of Higher National Certificates can obtain the full benefit from any of these courses.

They are in fact designed for men with experience in industry, and mature engineers, even with no paper qualifications, have been successful students.

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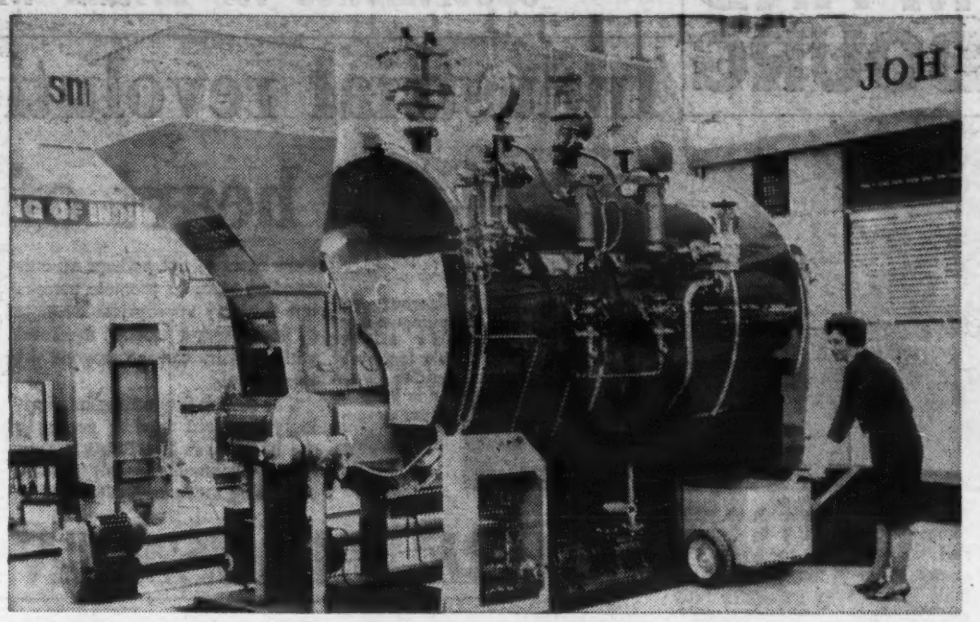
IN LEEDS: THE NORTHERN EXHIBITION OF FUEL AND POWER FOR INDUSTRY

THE Northern Exhibition in Leeds which closes tomorrow justifies the description "northern" in its location only; for—the biggest exhibition of its kind yet held outside London—it has attracted exhibitors from all over the country and twice as many from outside Yorkshire as from within it.

While stress is laid on fuel economy in many of the exhibits, it is virtually an engineering display—and, as such, has been welcomed by exhibitors.

They hope it may be followed by others of its kind; and Leeds (they point out), bordering the great Yorkshire coalfields, lying at the heart of an industrial area, is an ideal provincial centre.



This semi-wet back shell boiler with easily removed ash pan is being shown by John Thompson.

AN OLD TRAM DEPOT IS NOW THE SHOP WINDOW OF THE NORTH

SITED in what was formerly a tram-depot, now restyled and adapted as "The Queens Hall", this venue promises to provide the North with a provincial Olympia (complete with ancilliary bars and restaurants).

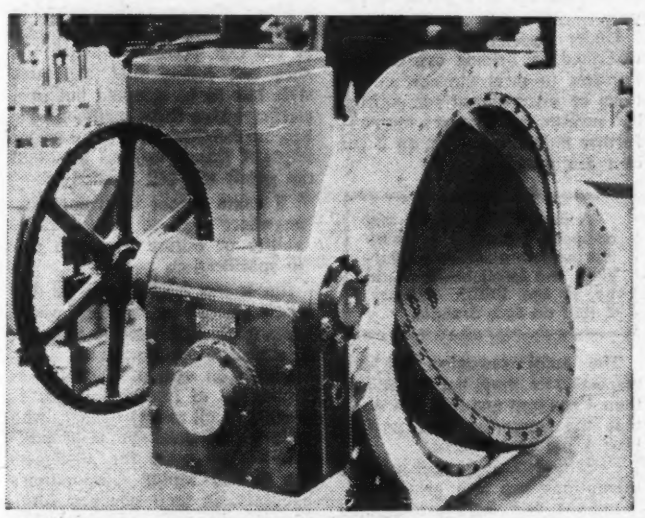
Opening the exhibition on October 18, Mr. J. C. George, Parliamentary Secretary to the Ministry of Fuel and Power, stressed the industrial value of this provincial exhibition, and accompanied by the Lord Mayor of Leeds, Ald. P. Woodward, subsequently toured the display.

Mr. George emphasised the importance which the government attaches to continued research and experiment in fuel conservation and economy.

Among the exhibits is a prototype, being shown for the first time. Produced by John Thompson (Wolverhampton)—this new coal-fired semi-wet back shell boiler's outstanding feature is a removable ashbox.

Dependent on the pressure required and achieved (by automatic control) this has a capacity of 200lb. of ash, and requires attention only at 4-6 hourly intervals.

A second economical feature is the 3-pass wetback combustion chamber, eliminating the need for expensive refractories. Designed for use with low-grade fuels, and fitted with a Triumph Stoker and a moving grate, it is being produced in sizes, ranging from 2,500-13,000 lb./hr., and 110-145 p.s.i.



Hopkinson of Huddersfield are showing this 40in. butterfly valve which gives complete sealing.

Ready for E.C.M.

Now engaged in developing the home market for this boiler, Thompson's are prepared—when and if the Common Market becomes a reality—to "strike a big blow at the Continent" with it.

Side by side with this coal-fired boiler, Thompson's have on view a 4,500 lb./hr. oil-fired boiler, and their two central stands are an outstanding feature of the exhibition.

Hopkinsons of Huddersfield, and their subsidiaries (Fieldens' Electronics, Wythenshawe, and Wolstenholmes's, of Radcliffe, near Manchester), have an impressive display of boiler mountings, high and low pressure valves, and electronic equipment.

Hopkinson's very comprehensive range of valves includes a 40in. butterfly valve. This is a droplight fabricated valve which, gives complete sealing and which has a design pressure of 50 p.s.i.g. and a temperature of 200 deg. F.

Though this has already been tested in service, it, too, is on view for the first time, and a spokesman for the firm thinks it likely that this type of valve will supercede the wedge-gate valve.

Mr. F. Richardson, the firm's sales manager, forecasts production of this valve in sizes ranging from 27in.-84in.

The Hargreaves Group of Companies—a local concern with headquarters at Bowcliffe Hall, Boston Spa, Yorks—is staging a spectacular exhibit illustrating its civil engineering scope.

Centrepiece of this is a vehicle — a part - tanker, part - tipping wagon—mounted on a raised "road" constructed by companies forming the group.

Electrode boiler

"Emma", a coke-burning boiler produced by Newton Chambers and Co. of Sheffield, provides an outstanding exhibit in the National Coal Board's display. The Yorkshire Electricity Board — obviously with an eye to the needs of the Leeds clothing industry—has harnessed a 15 kw electrode boiler, in conjunction with the necessary ancilliary equipment, to a demonstration Hoffman Press.

Marshall, Sons and Co. of Gainsborough, are showing two packaged boilers: Marshall CB125, oil-fired, packaged boiler rated at 4,310 lb.steam/hr. from 212 deg. F.; Marshall P20, oil-fired, packaged hot water boiler rated at 670,000 BTU/hr.

Their Cleaver-Brooks packaged boilers are four-pass horizontal fire tube units with five square feet of heating surface per rated boiler horsepower.

These packaged boilers are mounted on heavy steel frames and incorporated an integral forced draught burner and controls.

The hot water boilers incorporate a system which introduces the cooler return water in a direction which provides the longest tempering path attainable.

Thermal shock is therefore eliminated, uniform water temperatures are maintained, greater thermal efficiencies result and boiler life is extended.

Parkinson Cowan Industrial Products are co-operating with the NEGB. Among Parkinson Cowan equipment on display is their gas-fired infra-red oven with Pyrostat temperature control, for paint stoving and heat processing. This can reduce operations which previously took much longer to a matter of minutes.

The Mirrlees Watson Co. of Stockport, are showing the Mirrless size 50 "HF" automatic underfed stoker, specially designed for firing Lancashire, Cornish, and Economic type boilers. A feature of this stoker is that it usually can be installed in horizontal boilers without replacing the existing furnace front.

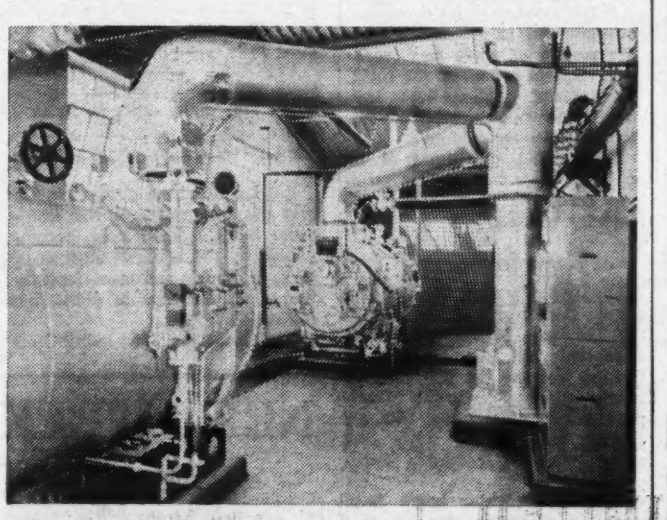
Cheap fuel

A forced draught burner unit, shown complete with grate, is designed to burn all types of solid fuel including the cheaper varieties such as coke breeze and reclaimed cinders.

One of the claims of the Stone-Vapor oil-fired packaged boiler, exhibited by J. Stone and Co. (Deptford), is that steam is available in two minutes from a cold start and thereafter produced only as required.

Fully self-contained and easy to install, these boilers are a fraction of the size and weight of conventional boilers of the same rating. Constant supervision is unnecessary.

The exhibition is by no means the only part of this event, for, throughout the ten days, conferences, discussions, film shows and forums have been taking place in the Conference Theatre, under the auspices of various national organisations and institutions. Tomorrow, exhibitors will hold an open discussion.



These two Marshall CB80 oil-fired boilers, each with a capacity of 2,760lb. steam/hour, are installed at the Bradford factory of Cresswell's Asbestos Co.

This is nothing to what goes on inside a

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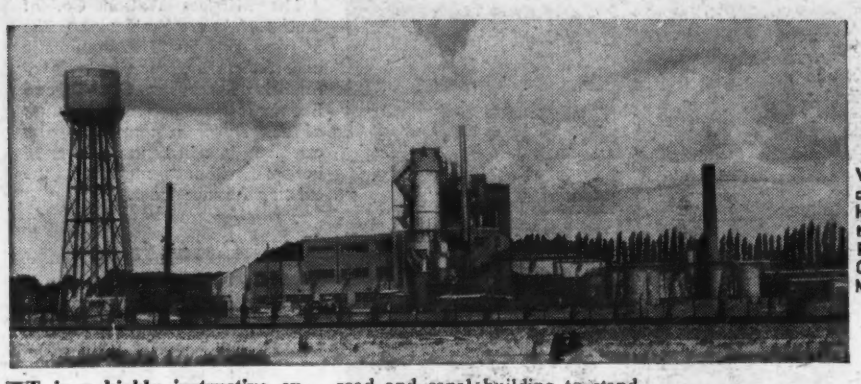
Opportunities for Britain within the Common Market

Industrial revolution in the heart of EEC

THE Common Market challenge to Britain is the biggest single issue since the war.

Engineering News presents a weekly survey of Britain's prospects. This week's report, the fourth in the series, is from Belgium and Luxembourg.



Vigorous encouragement has brought this factory of Procter and Gamble to Malines.

IT is a highly instructive experience to watch in a Brussels cinema a lengthy film on industrial progress in France, and to see Belgians applauding with gusto each new hydro-electric scheme, each new chemicals installation.

The nine million people of Belgium and Luxembourg are keenly European, and more than usually interested in industry and the means of production.

The characteristic most clearly shown by the Belgians is a capacity for survival.

In the Russian revolution, in the Communist revolution in China, and most recently in the Congo great overseas investments and possessions have been lost.

At home the country has been at the sharp end of the two European wars, and yet the impression I am gaining around Belgium is of a country alive with self-confidence; with a rate of road and canal building to stand comparison with any in Europe; and with the will to go to any manufacturer in the world for the tools to make its industries fully competitive.

Those I have spoken to have drawn an important comparison between British and Belgian industry.

"After yourselves," I have been told, "we are the second oldest industrial nation in Europe. Like you we have carried through a great deal of modernisation and re-equipping. But, also as in Great Britain, there is a lot still to be done."

It is in the effort of Belgium's industries to meet the full competition of the Common Market, and to take advantage of its emerging, broader form, that the opportunities lie for U.K. producers of capital equipment and machinery of all kinds.

There are encouraging signs of the way in which the prosperous markets of Belgium and Luxembourg are being tackled by some British manufacturers.

Walk inside the British embassy in Brussels and you will see an unusual sight. Sparkling kitchen equipment set out attractively in show cases — not perhaps an outstanding place to promote utensils but a highly appropriate example of how a sound product, marketed with a flair, can go beyond its expectations.

The British firm selling its pleasingly coloured kitchen goods in the BLEU area (the Belgo-Luxembourg Economic Union) became something more than interested in the price policy of the German competition.

Market inquiries in the German home market revealed the rewarding situation that it was possible to build up a growing sales volume among the increasingly discriminating German housewives, turning to fresh designs and colour schemes as a variation from the home product and an expression of their own new spending power.

In a combined Belgian and Luxembourg import bill for last year of £1,413 million, the U.K. share was 7.3 per cent, a substantially better performance than for many other European markets.

Even so, with an income per head that had increased from £311 a year in 1956 to £350 in 1959, the value of imports per head from Britain last year was only £11.

Common Market prospects in Belgium for at least two sections of British industry present an interesting complication.

Who benefits?

Both the textile and the paper interests in Belgium have been described to me by a banker from the textile area in the north as being uncertain whether they or their British counterparts will benefit most from an enlarged European Economic Community.

If imports of textile and of paper products into the country rise appreciably it will not help the export of textile or paper-making machinery from Britain.

While these considerations are essential in discussing how the pattern of trade may work out, they do not affect the solid achievement Belgium now has behind her as a member of the Benelux customs union.

In the first ten years of its existence trade between its members (Belgium, Luxembourg and Holland) trebled.

New factories

Confidence among the Belgian people that they will do well in the Common Market — a poll conducted by the Council of Europe showed 83 per cent in favour—exists despite the "Europeanisation" of the coal industry closing numbers of high cost mines, with the inevitable unemployment.

Vigorous efforts have been made in retraining displaced miners and new factories, encouraged by government schemes and favourable location, are moving into areas once narrowly dependent on coal mining.

All-out efforts to bring outside manufacturers into Belgium include an attitude to interest rates that makes Britain's 6½ per cent Bank Rate appear discriminatory.

The city of Malines, ten miles from Brussels airport, 14 miles out of Brussels and 18 miles from Antwerp, is generally credited with having started the official encouragement of immigrant industry.

With the International Standard Triumph vehicle works of Leyland Motors, Procter and Gamble Belge, Du Pont de Nemours Belgium, Peugeot, and Mercedes-Benz assembling cars and two big plants for the metals industry, the city has now assembled a list of references indicating that its system is effective.

Under special laws passed to promote industrial investment in the country it is possible to raise money at 4 per cent below the market rate. This is done by general aid specifying reductions in interest up to 2 per cent per year.

Under special aid, which is described as helping existing enterprises to meet the new conditions of international competition by investment programmes, further reductions of up to 2 per cent are possible.

A useful first call for any company intending to market or manufacture in Belgium and Luxembourg would be at the British Embassy, 2 Rue de Spa, Brussels.

The total reduction below market rates must not be greater than 4 per cent and it is laid down that the borrower must pay at least 1 per cent interest.

Certain state guarantees and tax exemptions are also given.

Interest free loans are granted for research projects and the perfecting of prototypes or manufacturing processes where these are to be carried into effect in Belgium. Up to half of this cost can be borrowed in this way.

The effect of all the in-rush of industry this has brought on has been the start of wide diversification away from the old dependence on textile mills in the north and steel mills in the south.

Joseph Lucas, the motor accessory firm and the Ford Company's German subsidiary have taken land near canal facilities.

Packaging concerns, stainless steel, chemicals, electrical equipment, and many other interests—often U.S. or German based—have made a start or plan to do so.

Belgian industrialists explain that the first stages of the Common Market have been accompanied by the boom conditions of West Germany, and more recently the rapid advance in French industrial output.

This has meant that many firms have been able to carry out contracts placed from across the border. As German wages continue to rise faster than productivity and with the volume of increased output called for in the now-published French Four Year Plan, this is likely to continue.

Its importance to the economy is likely to diminish with the range and capacity of varied industry springing up from either Belgian or overseas sources.

Counting the cost

In the consumer field the prospects for British goods are outlined as being closely related to the price; to sustained performance in making them known; and to the existence in Belgium and Luxembourg of spare parts and service facilities equal to those kept up by the other European countries and the U.S.

Just as the leading officials of the power supply systems like to see senior executives of the electrical equipment exporters, so the buyers in the big Brussels stores expect visits from manufacturers.

Putting glossy photographs before a busy buyer, I was told with a vehemence presumably born of experience, is just a waste of time.

More than anywhere else in Western Europe I felt the impact of the U.S. marketing attack. It does not follow that the same style has to be adopted but in a market where these methods have become familiar there is no longer hope, if there ever was any, that the goods will sell themselves.

I came across no complaint anywhere against British reliability or failure to match up to specification.

But it was freely suggested that modifications in styling would make a big difference in the sales of domestic appliances.

Finish on cars of all prices is a question of first importance. It is not difficult to find Belgians who believe that once the tariff position is the same for all-comers the British Motor Corporation's babycars, in their cheapest form, will enjoy a really big demand.

Summing up

CONCLUSIONS: Brussels contains the Common Market headquarters and the beginnings of the new, familiarly termed, Super-market in which the city hopes the European Economic Community secretariat will permanently settle.

Belgium and Luxembourg are well on the road to being one of the most intensely productive industrial areas of the Common Market. Two main lessons emerge.

If British manufacturers, either of capital or consumer goods, are to do justice to this market, our representatives and agents will have to become as numerous as the German, Italian and French.

The second is that the Belgian authorities by the skilful application of cheap money are inspiring another industrial revolution. With our own rates of investment in doubt the Treasury might do worse than follow suit.

MORE SALESMEN NEEDED

ENGINEERING NEWS sends its Industrial Editor-J. D. F. Perry to report from inside the COMMON MARKET. . .

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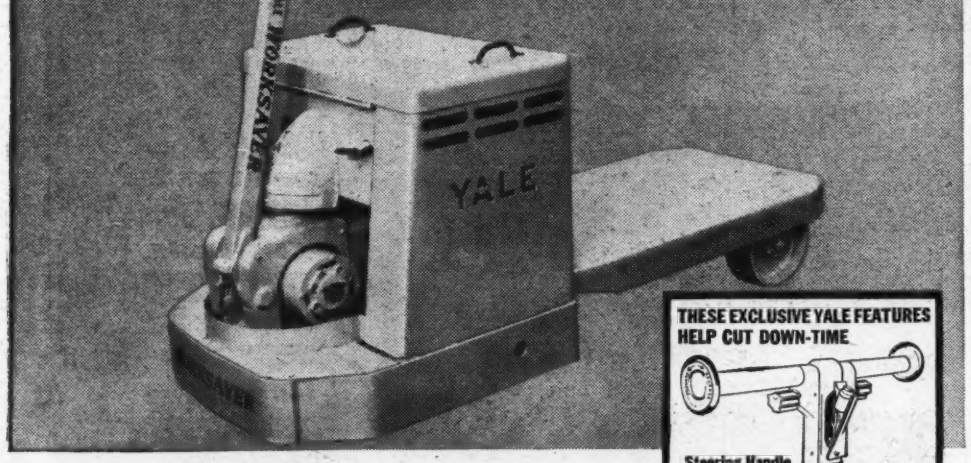
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Scientists discuss reactors

NEARLY 200 scientists from 34 countries attended a symposium organised by the International Atomic Energy Agency in Vienna which closed on Friday.

"At present there are about 150 research reactors operating in 40 countries, and many more are being planned or under construction," said M. Pierre Balligand, I.A.E.A., deputy director general for technical operations.

"These are expensive tools, and it is important that such facilities should be fruitfully exploited.

"There were many problems encountered in the formulation of satisfactory and practical programmes for the utilisation of research reactors," he said, "and the symposium was the first step in this direction.

Practical ideas

"It was hoped it would help newly developing countries by giving them practical ideas and results of experience gained in senior laboratories.

"Relatively advanced countries could also benefit from the symposium, since their research reactors were not always fully utilised."

During the eleven sessions problems of nuclear and solid state physics, radio chemistry, reactor chemistry, and isotope production were discussed.

1m. hours—no accidents

A MILLION working hours, covering a period of 18 months, without a single accident causing loss of time is the record set up by the Chance-Pilkington Optical works at St. Asaph, North Wales.

Yorkshire to have £65m. power station

IT WILL BE SITED ON THE RIVER AIRE WITH OUTPUT OF 2,000 MW

YORKSHIRE will have the largest power-station in Western Europe when the new Ferrybridge "C" station (full details of which have just been made known) is completed in 1967, at an estimated cost of £65 million.

Sited, like the present "A" and "B" stations, on the right bank of the River Aire, the eight 375ft.-high cooling towers which will flank its main building will be an outstanding landmark to be seen from the A1 road nearby.

The station's four steam turbine-driven generating units will each have a production-capacity exceeding the 470 MW combined output of the existing stations, built in 1927 and 1959 respectively.

The total capacity of the new station will be 2,000 MW, and its output, like that of the present "A" and "B" stations, will be fed into the national grid.

Production is expected to start with the commissioning of the first turbo-alternator set in 1965.

Barge and rail

The Yorkshire coalfields will provide most of the coal required, and this will be carried by conveyor from a combined storage plant near the river.

Provision is to be made for the handling of some two to three million tons of coal a year by barge, and some five million tons by rail to meet the combined needs of the "B" and "S" stations.

Plans for the rail-delivery of coal include a loop from the main line, from which coal-trains will be able to discharge their loads (possibly while still in motion) from hopper-bottom wagons.

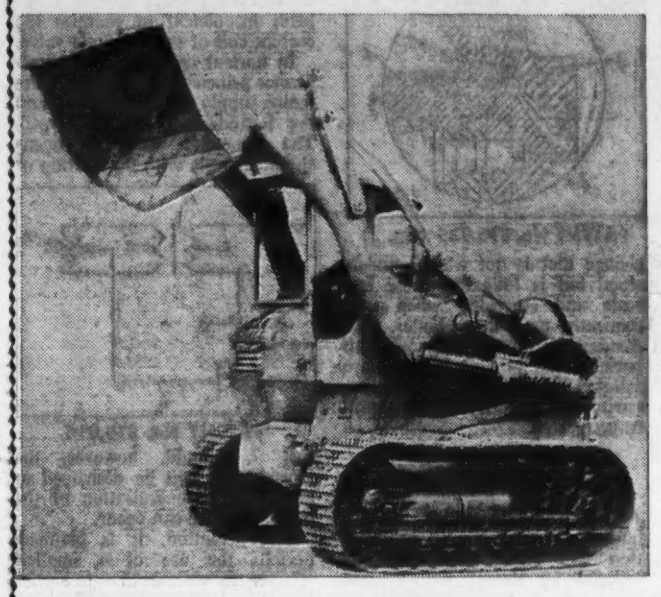
Mr. B. Powell, the project engineer, giving details of the new station last week to local council representatives, estimated that the two extraction-plants would eliminate 99 per cent of the grit, and that by 1963-64 it should be possible to close-down the low-pressure plant at present in use at the "A" station which, it had been suggested, was responsible for much of the existing grit.

Surplus gases

Passing through extensive dust-extraction plant, surplus gases from the new station will be discharged from two reinforced concrete chimneys, 650ft. high.

Construction of the new station (on which preliminary work has already started) will find employment for some 2,000 men, and when it becomes fully operative it is expected to provide work for a staff of 450.

Eimco loader works on 1 in 1 slopes



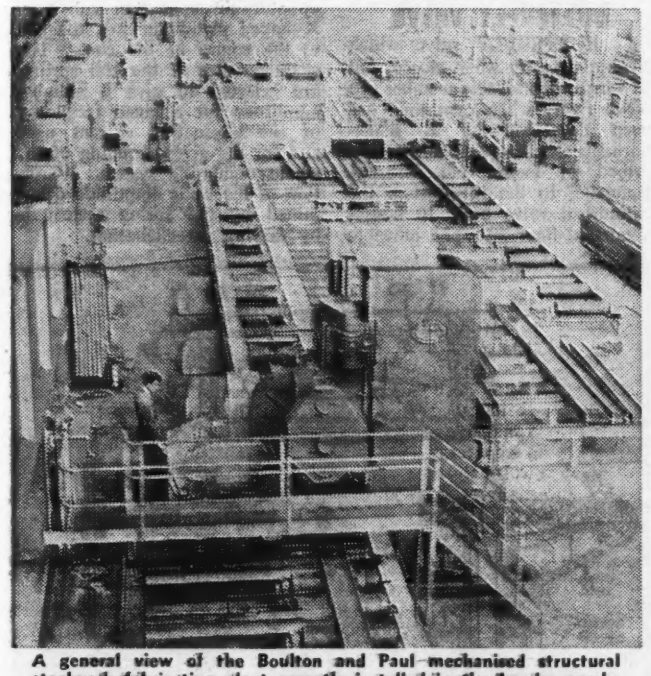
FORWARD driving position is one of the features of a new front end loader available from Eimco (Great Britain) of Gateshead.

Known as Model 123, this machine is capable of operating on slopes of 1 in 1 forward and backwards, and of exerting a break-out force of nearly 12 tons.

The loader has a bucket capacity of 1¼ cub. yards, dump height of 9ft. 7in. and dump reach of 3ft. 8in.

Four forward and four reverse gears are fitted, with independent control to each track. Torque converter drive automatically matches speed and pull to the load imposed, giving maximum torque at all times.

SPECIAL PLANT FOR AUSTRALIA



A general view of the Boulton and Paul mechanised structural steelwork fabricating plant recently installed in the London works of Moreland Hayne & Co. In the foreground is a vertical saw, behind it to the right a 12-spindle horizontal flange drill, and in the background a 6-spin vertical (web) drill.

ONE of the largest mechanised structural steel fabrication plants so far produced by Boulton and Paul has just been completed at their Riverside Works, Norwich.

Valued at nearly £100,000, the plant has been specially designed to meet the requirements of Johns and Waygood for their South Melbourne works.

It will cover a floor area of about 21,000 sq. ft. and the components are now being crated for shipment to Australia.

The plant is capable of handling, sawing and drilling steel sections up to 50 ft. long and 36½ inches wide. Machines are linked by a system of conveyors and transfer benches, all controlled from three pushbutton stations.

PIPELINE IN THE SKY

Riddle Airlines Inc. are flying British turbo-prop Argosy air freighters up to 13 hours daily on the U.S.A.F. Logair routes. Logair is one of the world's largest scheduled cargo operations—an aerial pipeline for the quick supply of urgent military equipment. □ From coast to coast these new Armstrong Whitworth aircraft, with their special Rolamat quick loading systems, speed outsize military cargoes in their capacious holds, over a network of routes covering the U.S.A. Daily schedules bridge more than 12,000 miles. □ Soon, B.E.A. will be doing the same on their all-freight routes. Argosies will open up new high-speed supply lines for outsize cargoes between the U.K. and Europe. □ The Argosy is the only aircraft in the world with truck bed height double-end loading. Using the Rolamat cargo handling system, up to 13½ tons of bulky freight can be loaded swiftly through the full-width doors at each end of the 47 ft. long, 6 ft. 8 ins. high, 10 ft. wide fuselage.

This fast turbo-prop freighter offers:
To the manufacturer—large dimensions, minimum packaging, less insurance, negligible damage, high speed transit, less dismantling and reduced dispatch charges.
To the customer—quicker and cheaper delivery, reduced stocks and inventories, more positive supply schedules.
Transportation economics for machinery or other special equipment can now be considered at the early planning stage.

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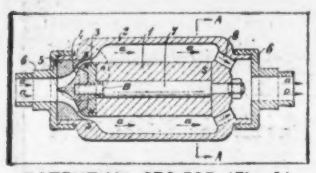
Minimising boiler scale by magnetisation

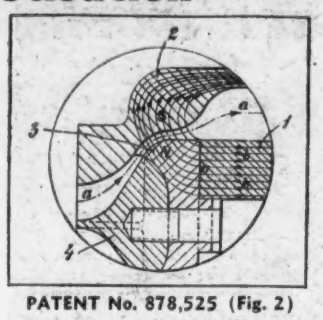
BOILER scale and corrosion can be substantially reduced by magnetic treatment of the boiler feed water, **Olaf Fjeldsend of Norway** claims in **Patent No. 878,525.**

The apparatus for magnetising the feed water comprises a magnetic core 1 surrounded by a soft iron sleeve 2. A coaxial soft-iron pole piece 3, and a streamlined pointed nose 4 with baffles of non-magnetic material, are located at one end of the core. The sleeve 2 has a soft-iron mouthpiece 5 and a tubular end cover 6 of non-magnetic material.



PATENT No. 878,525 (Fig. 1)

Liquid, indicated by arrows (a), passes through the magnetic gap, through the annular space between the core 1 and the sleeve 2, and through the outlet channels 8. During its passage through the apparatus the liquid undergoes a change that is not wholly understood but is found to cause less scale and corrosion when subsequently used in a boiler. The dimensions of the magnetic gap between the N and S poles are selected in accordance with the purity and viscosity of the liquid to be treated.



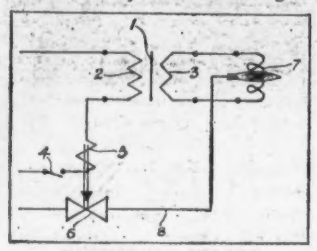
PATENT No. 878,525 (Fig. 2)

CUT-OUT DEVICE

AN electric incandescent-ignition cut-out device for gas burners, of very simple construction and small dimensions, is covered by **Patent No. 879,016** granted to **G. Kromschroder A.G. of Osnabruck, Germany.**

In this device, the gas supply is controlled by a magnetic valve 6, the current coil 5 of which is connected to the primary winding 2 of a transformer 1. The secondary coil 3 of the transformer is connected to a platinum wire ignition coil 7. The primary winding of the transformer is so designed that in open circuit the transformer takes only a small load, insufficient to energise the current coil of the magnetic valve.

In normal operation, the transformer primary is connected to the mains supply by the switch 4, and the incandescent coil is heated. The magnetic valve 6 opens simultaneously with the heating of coil 7. Should, however, the incandescent coil be destroyed or burnt-out, no energisation of the magnetic valve can occur.



PATENT No. 879,016

The invention, it is claimed, permits the use of a smaller, cheaper transformer than in earlier forms of incandescent-ignition cut-out devices, and eliminates the need for thermal bimetallic release, microswitch and relay. Use of a platinum coil instead of a conventional chromium-nickel coil makes for smaller coil dimensions and moreover the resistance remains substantially constant with temperature variation.

new PATENTS

OFFICE FURNITURE

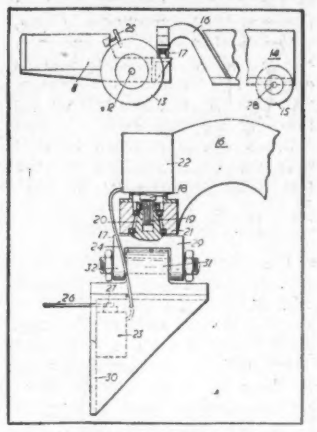
MULTIPLE office desks embodying a duct for electric cables to telephones, electrically operated typewriters and recording apparatus so that the confusion of intertwining wires is eliminated, are described in **Joseph Lucas (Industries) Ltd's Patent No. 878,627.**

A longitudinal desk built up of units arranged end to end has lateral "sprigs" extending laterally from each side, offset from each other so that each work station, in addition to the sprig, includes a part of the longitudinal desk. Beneath the body part of the longitudinal desk runs a channel section duct, mounted on its side and assembled in sections. One flange is secured at intervals by angle-section brackets to the main desk body. At intervals along the lower flange of the duct, screw-threaded spigots engage in adjustable supporting feet. The duct serves to accommodate all electrical wiring for a variety of office appliances, any convenient means being used for accommodating the cable extensions to the top of the desk. The invention can also be applied to office desks formed as a single unit.

ARTICULATED VEHICLE

A STEERABLE articulated vehicle, using a two-wheel trailer and a modified normal tractor, for the transport of materials, scraper work on roads, etc., is the subject of **Patent No. 878,485 taken out by More Wear Industries (Rhodesia) (Private) Ltd. of Salisbury, Rhodesia.**

In this modification, the front wheels are removed from a normal four-wheel tractor 11. A two-wheel trailer 14 is supported at its forward end by a gooseneck beam 16 resting on a coupling mechanism 17 on the tractor.



PATENT No. 878,485

This arrangement allows the forward part of the tractor chassis to cantilever from the rear axle 12.

The vehicle is steered by swivelling the tractor 11 about the pin 18, which is splined into socket 20. The latter can rotate in the block 21 which is secured to the end of the gooseneck.

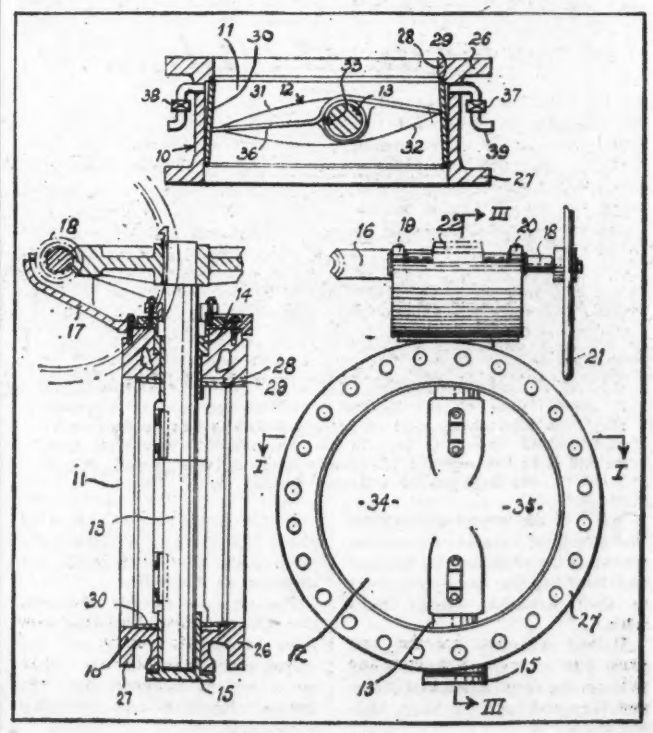
The steering mechanism is controlled through a hydraulic valve box linked by connecting rods to the tractor steering wheel.

BUTTERFLY VALVE

A BUTTERFLY valve which seals tightly when closed, but in which the movable member can move freely when operating, has been developed by **J. Blakeborough and Sons Ltd.** and is described in **Patent No. 878,555.** Referring to the illustration, the cylindrical valve body 10 houses a tapered liner 30. The movable valve member 12 is circular, with convex faces 31 and 32. It is keyed to a shaft 13 which passes through a bore offset from the centre of 12. The shaft 13 is parallel with, but offset relatively to, a diameter of the tapered liner 30. Thus there is a major portion 34 of the movable valve member 12 at one side of the shaft and a minor portion 35 at the other side.

The movable member 12 is proportioned so that, when in the closed position engaging with the liner 30, it is not quite square to the liner axis. When opening, the major portion 34 of the movable member 12 swings towards the larger diameter of the liner 30, and the minor portion swings towards the smaller diameter of the liner. The periphery of member 12 has uninterrupted engagement with the liner 30 when the valve is closed.

Because the liner 30 is tapered, there is an annular space between it and the valve body 10. Preferably, a flexible liner would be used and the annular space would be open to the pressure side of the valve. Thus, when the valve is closed, pressure in the annular space will tend to press liner 30 into tight engagement with the valve member 12.



PATENT No. 878,555

ELECTROVIBRATOR

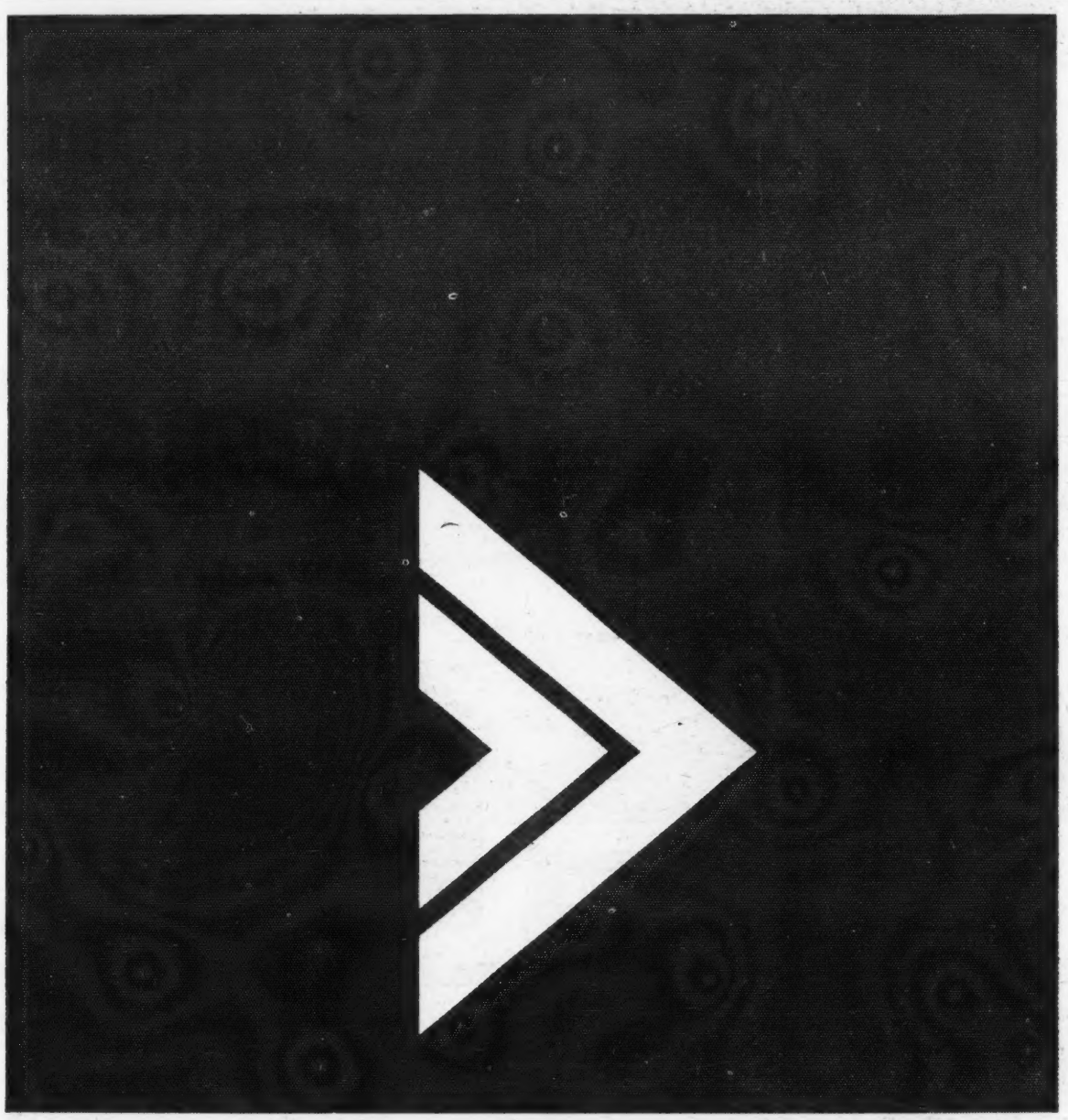
AN electro-magnetic vibrator employing no permanent magnets in which the vibration amplitude can be readily regulated, is deschibed in **Patent No. 876,950, of F. L. Smidth & Co., Denmark.**

In this invention a rod-shaped armature mounted on pivoted links is arranged to vibrate in its longitudinal direction in an air space formed between two or more magnet systems fed with alternating current to produce at any moment a unidirectional flux lengthwise through the armature.

A sturdy short-circuited winding is mounted on the armature in the field set up by the alternating currents. A supplementary d.c. excitation of the magnet systems sets up a constant magnetic field. This, acting on the currents induced in the squirrel cage by the alternating magnetic field, causes the armature to vibrate.

Each magnet system comprises an E-shaped core, the legs of which are all equipped with exciting windings, a.c. windings on the two end pole legs and a d.c. winding on the centre pole leg, which is opposite the short-circuited armature winding.

Coil springs parallel to the armature are connected with it by X-shaped plates and are attached to the centre of the core. The characteristics of the coil springs are selected to give a suitable amplitude for a given frequency of the alternating current used and for the given damping of the whole oscillating system. Variation of the basic amplitude determined by the spring system is by varying d.c. excitation.



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Liquid nitrogen brings greater safety to contraction assembly

by

W. J. GRANT, B.Sc., F.R.I.C., A.M.I.Chem.E.

IN an assembly in which a part such as a shaft, pin, liner, valve seat, ball race, etc. is fixed into a hole or cavity in an outer part, the designer usually has a number of ways available for securing tightness.

Contraction fitting is an attractive method in cases where subsequent dismantling is not necessary, since no threads, keys, cotters, or heavy pressing are then required.

The method involving cooling of the inserted part is advantageous in cases where heating the outer part would be slow, inconvenient, and costly, or where heat would cause damage to the part.

Well-known

The cooling method is fairly well known, and has been used for mass production assembly and for special one-off jobs.

Liquid nitrogen is particularly suitable as a cooling medium in contraction fitting.

Compared with liquid air and liquid oxygen, which have also been used for this purpose, liquid nitrogen has the advantage of being inert and involving no fire or explosion hazard; its use requiring no degreasing of parts to be fitted, nor any special workshop precautions.

Compared with solid carbon dioxide, which has also been suggested for this application, liquid nitrogen has the advantages of much lower temperature giving greater contraction, and of not requiring any auxiliary liquid medium for heat transfer (carbon dioxide is used in conjunction with acetone or methylated spirit).

Precautions

The only precaution ordinarily to be taken in using liquid nitrogen is avoidance of its contact with the skin. Protective gloves and suitable tongs should be used in transferring small metal parts cooled in liquid nitrogen.

Larger parts would be handled mechanically and care then is mainly required in dispensing liquid nitrogen into large open vessels.

Cooled parts are withdrawn from the vessels as required for assembly, and the vessels are kept replenished with new parts and with liquid nitrogen as necessary. A simple system of this kind makes use only of the cooling effect due to evaporation of liquid nitrogen.

When the number of parts to be treated is large enough to justify rather more elaborate equipment, nitrogen consumption can be reduced by making use of the cold evaporated gas to precool the parts prior to their immersion in liquid nitrogen.

The simplest type of precooler consists of a wire basket containing several layers of components suspended in the cold gas stream above the liquid nitrogen bath.

A more elaborate precooler would comprise a conveyor moving components through an insulated tunnel countercurrent to the cold gas evaporating from the liquid nitrogen bath.

Use of a precooler allows for evaporated nitrogen gas to be discharged at a temperature above the boiling-point of liquid nitrogen and obtains a greater cooling effect per unit quantity of liquid nitrogen used.

In the case of one-off jobs, or where relatively few pieces are to be treated, it is preferable to use a liquid nitrogen bath not very much larger than needed to contain one piece and the nitrogen required for its cooling. In this case it is generally not essential to have very best insulation of the vessel, since the cooling of a single part usually occupies only a number of minutes, and losses in such a period due to poor insulation are less significant.

The amount of heat to be extracted from a metal component in cooling it from workshop temperaure (70 deg. F.) down to liquid nitrogen temperature (−320 deg. F.) is 390 deg.×average specific heat of the metal.

Working on a well-organised continuous basis with fairly small components, actual nitrogen consumption should not be more than perhaps 30 per cent greater than calculated. One-off jobs usually involve higher losses.

The shrinkage per linear inch of dimension of a component cooled in liquid nitrogen depends on the average coefficient of expansion over the temperature range concerned.

MATERIALS	Average coefficient of expansion per °F	Shrinkage per linear inch on cooling from 70°F to -320°F
Mild steel	5.1×10^{-6}	2.0 x 0.001"
Stainless steel (18/8 Cr/Ni)	7.4×10^{-6}	2.9 x 0.001"
Copper	7.9×10^{-6}	3.1 x 0.001"
Bronze	8.9×10^{-6}	3.5 x 0.001"
Brass	8.9×10^{-6}	3.5 x 0.001"
Nickel	5.5×10^{-6}	2.2 x 0.001"
Monel	6.6×10^{-6}	2.6 x 0.001"
Aluminium	10.0×10^{-6}	3.9 x 0.001"

For a satisfactory tight fit it is usual to machine an insert to have an interference of approx. 0.001 in. per linear inch diameter at normal temperature.

From Table 1 it may be seen that liquid nitrogen cooling would shrink such an insert to give a clearance of 0.001 in. per inch in the case of steel and rather more for non-ferrous metals. This clearance allows easy fitting without heavy pressure.

Clearly, the tolerances on the machined dimensions of the inserts and the holes must be not greater than ± 0.0005 in. per linear inch and are preferably less.

In one-off jobs, the insert is usually machined to an exact size for contraction fitting.

Contraction fitting using liquid nitrogen cooling is suitable for inserts down to about ½ in. diameter in steel, or somewhat smaller with non-ferrous metals.

Fine limits

It can of course be used with even smaller diameters, but then becomes increasingly difficult because of the fine limits of machining and measurement required, and because of the quick warming up of very small parts which necessitates very rapid positioning of the insert. The process has been used satisfactorily for small objects such as valve seats, shafts of small pumps, and so on.

There is no very definite upper limit of size of component for which the process is suitable. It has also been used on such large pieces as a dragline king pin 2 ft. long by 11in. diameter and on 2ft. diameter trunnion pins for 100 ton steel ladles.

Use of nitrogen shrinking in assembling components for heavy machine tools has given impressive savings in time and money at Bayliss, Jones and Bayliss Ltd., Wolverhampton. Picture shows a shrunken pinion being lowered into a gear wheel bore.

Contraction fitting is an assembling process in which a component is tightly fitted into an outer part by heating the outer or by cooling the inner member to obtain a tight fit when temperatures of the two parts are equalised.

GLASS OF THE FUTURE IS ALUMINO-SILICATE

CONTINUAL development is required to overcome the problems arising in supersonic flight. The safety-glass industry, as with other manufacturers of skin materials, are faced with increasing temperature problems as the speeds of aircraft increase.

The Triplex Safety Glass Co. have been involved in the manufacture of aircraft windscreens since the first World War. Like previous types of glass construction, the type now in use is nearing its temperature limit for high-speed aircraft.

With Chance-Pilkington, the glass manufacturers, Triplex have developed a new type for high-speed aircraft.

This is an alumino-silicate glass which can be toughened and will retain the strength properties of toughened glass at higher temperatures than ordinary plate glass.

It will be used in the next generation of military aircraft and will be necessary in the first supersonic airliners.

Triplex scientists foresee that eventually even alumino-silicate glass will be superseded by fused silica, a transparent glass-like material which retains its properties at red heat.

Another material which may be used is the new Pyroceram material being developed in the research laboratories of the glass industry.

Tonnage record

THE No. 3 blast furnace at the Clay Lane Ironworks of Dorman Long (Steel) Ltd., has produced two million tons of basic iron since it was brought into commission in December, 1956.

This is a record tonnage from the larger blast furnaces now operating in this country.

The furnace is still in commission and will continue into 1962 before relining will be necessary.

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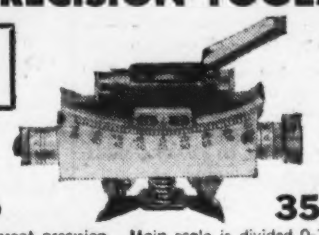

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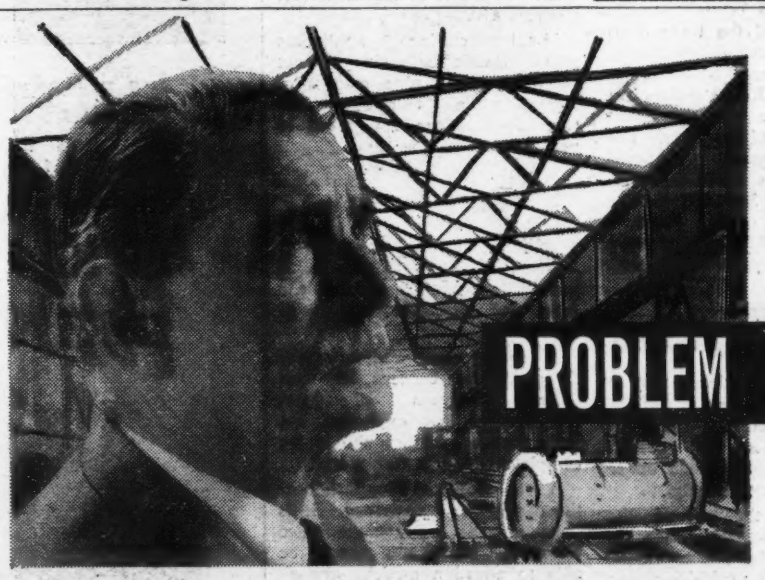

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ENGINEERING NEWS

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Thursday, October 26, 1961

Experiment in youth

DYNAMIC leadership by a man of enthusiasm and courage with guidance from an assistant who tends to be over-cautious has often proved to be the right mixture for running a prosperous business.

The active leader supplies new ideas and forces the pace, whereas the assistant holds back and consolidates the ground already covered.

Such an ideal combination is not easily formed, and all too often we find engineering companies with over-cautious leaders controlling a frustrated staff of younger and more active men who are unable to exercise their talents and ingenuity.

*

Progressive young men finding themselves in this position tend to leave the industry for more fruitful occupations, sometimes in a completely unrelated field.

This exodus leaves behind the faithful followers and the downright duds — a thoroughly bad thing for an industry which should be alive and kicking.

Many have said that new ideas must come from the top, but this is not inevitable, and an interesting new approach to this problem has recently come to notice.

A number of young men, age 21 to 24 have formed an engineering group in Gateshead, known as the North East Production Development Association.

This Association campaigns for the greater adoption of production engineering, particularly in the North East.

*

Their aim is to help boost the engineering industry by increasing the awareness by management of the benefits to be derived from the introduction and expansion of production engineering in their companies.

Their chairman, Mr. J. A. Cain, said that already they have been allotted several tasks by local firms.

This is a bold experiment and we shall await its progress with great interest. Let youth supply the power, but experience control the brakes and steering.

Tomorrow's technology

CERAMICS are likely to play an important part as an engineering material of the future.

The use of ceramics for electrical and furnace applications has hitherto been limited to parts in which the loads are small or mainly in compression.

Research work is gradually overcoming some of the basic problems such as strength, variability, and brittleness so that ceramics will be used more and more by engineers who require a material to withstand corrosive conditions or high temperatures.

A multitude of new ceramics has been announced in recent years as a result of fundamental research and many of these will become commercially feasible in the near future.

An Engineer's DIARY

Windle takes her last ride—into a museum

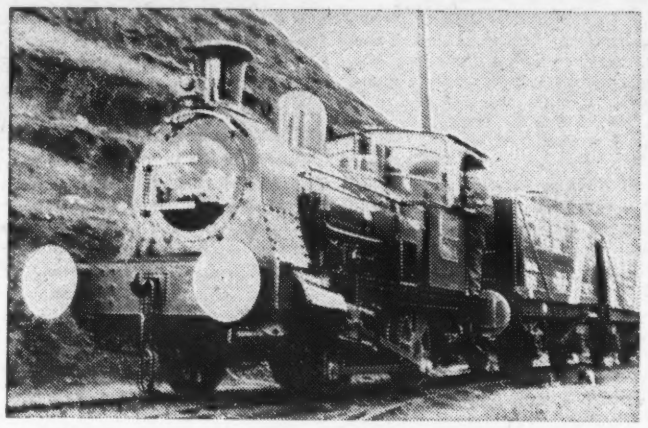
RAILWAY enthusiasts will be pleased to learn that 52-year-old 'Windle,' the last of the Borrows-type steam locomotives to be used on the nine-miles of track within the Pilkington Brothers sheet glass works at St. Helens, has been presented to the Middleton Railway Preservation Society.

James Cross, at one time locomotive engineer of the St. Helens Railway, set up his own business and designed and built the first of this special type of engine round about 1866.

He gave up his business soon afterwards, but Edward Borrows, who had been locomotive superintendent under James Cross, launched his own engineering concern and began to build this type of engine.

The design of the Borrows-type engine is quite original and unconventional in that its water tank was built under its boiler onto the chassis of the engine between the wheels.

The advantages of this type of engine were that it made the frame into a box-like construction of high strength and rigidity perfectly adapted to the rough and tumble of industrial life.



Windle, a 52-year-old Borrows type engine was presented to the Middleton Railway Preservation Society recently by Pilkington Brothers Ltd., glass manufacturers of St. Helens, Lancashire.

Too many ships

TOO many ships and too much shipbuilding capacity — this has been the increasing trend in the post-war years.

Three new vessels are now to be built, financed from the dollar balance of Italian war reparations to Greece.

The three ships, all for the Mediterranean trade, are to come from the yards of the Cantieri Riuniti dell'Adriatico (CRDA). They are worth almost 11 million dollars, the Italian Government having some time ago agreed to the use of the reparations for the building of these vessels.

The tenders of the three firms finally are worthy of study. The Schlieker yards, of Hamburg, put forward 3,230,000 dollars for each ship and a ten year credit for 70 per cent of the value. The Hellenic shipyards proposed 3,337,000 dollars each — cash. CRDA offered 3,850,000 dollars and a five year credit. Payment terms of the CRDA tender were modified to fit payment through the reparations.

Canada or E.C.C.

OFTEN enough the economic news I hear from Canada is gloomy. Recurring assertions that subsidiaries of British industrial concerns will do better are not wildly encouraging.

By contrast the air of the European Common Market countries is all elan and eagerness. Unemployment is vanishing away; work, good roads and comfortable homes for all.

Now comes the interesting reminder that in the first half of this year Canadians bought four times as much per head of their population as the Common Market Europeans.

Mr. John L. Bonus, representative in Canada of the Federation of British Industries, pointing this out at a recent FBI meeting in London, observed that this was despite the "Buy Canadian" campaign and its accompanying protectionist measures.

That we are badly out of balance in trade with the trans-Atlantic dominion is shown by Mr. Bonus' figures that the United Kingdom sells almost £215 million of goods a year to Canada, and buys close on £359 million from the Canadians.

Soviet progress

HOME comforts are growing at a faster rate in the USSR than any other part of their national economy. The slowest advance is in the field at private transport.

The Soviet Statistics Board state that in the first nine months of the year, production of washing machines rose by 41 per cent (to 911,000). Production of refrigerators rose by 30 per cent (to 503,000).

Motor cycle and motor scooter production rose by six per cent, and that of motor vehicles by seven. In the public transport field, the electric locomotive is catching up with the diesel locomotive. Electrics increased in output by 29 per cent, diesels by 11, but the totals are still well apart—diesels 1,064 manufactured, electrics 410.

Metal cutting appliances (122,000) were only six per cent up on the first nine months of 1960, while television sets (1,432,000) put on a vigorous 16 per cent.

Large step

I HEAR that in Kansas prototypes of a four to nine horse power "minimum" car for the Asian and African markets are in production.

A former vice-president of the Cessna Aircraft concern, Mr. Tom Salter, chairman of Pyco Incorporated has said that the first running model should be complete within a few weeks.

A step above the bicycle is how the car is being described. It is intended that the average office worker in New Delhi should be able to afford a model.

The price is expected to be about 400 dollars, or £120 — some step up from a bicycle!

Leo, the judge

TWENTY people who might otherwise have worked a non-stop shift system for two days at this week's Royal Dairy Show have not been needed.

For the keenly awaited milking trials results were worked out and the winning animals named within an hour by a LEO electronic computer.

Three samples of milk were taken from 346 cows and 79 goats in the course of Sunday. After analysis for butterfat and SNF (solids not fat) content the accumulated data was punched on to paper tape and fed to the LEO.

Within an hour the computer had printed 17 copies of the placings and simultaneously selected the winners in each class.

LEO had been programmed to take into account the vital statistics of the contestants. In a cow these are age, breed date of calving and what Mr. F. R. Francis, secretary of the Royal Association of British Dairy Farmers mysteriously terms "and so on."

John Heywood

SOVIET ENGINEERING

by our own correspondent

Gas, water, electricity carried by one cable

A METHOD of gas-electric welding developed in the Paton Institute of Electro - welding attached to the Ukrainian Academy of Sciences has led to the construction of new kinds of electric cable which can also transmit water and gas.

The method involves safeguarding the welding position from oxidisation by means of a jet of inert gas instead of flux.

This demands that not only electric current but that inert gas and water for cooling the apparatus should be fed to the welding position.

The new cables are of two kinds, one with seven channels and the other with five, and are being produced by the Kiev factory "Ukrabel".

The seven-channel cable has three electric conductors; three rubber tubes for supplying inert gas, cold water, and a hot water return; the seventh is for remote control.

In the five-channel cable, the first channel is used for electric current and the water for cooling purposes. The second channel returns the hot water.

Inert gas flows along the third channel, and a remote control conductor is laid in the fourth; the fifth channel contains the electrode wiring for welding.

* * *

The first high - temperature microscope to be built in the USSR has been designed by a group working in the Institute of Silicate Chemistry of the Academy of Sciences. It can be used to study processes up to 2,800°C.

The report states the the microscope will be used in the laboratories of the institute to study the properties of silicate materials containing rare and scattered elements.

A 300-passenger hydrofoil, the biggest river type yet produced, has been completed at the Red Sormovo Yards in Gorky.

* * *

Trials of the "Sputnik" have proved satisfactory and speeds exceeding 42 knots have been achieved.

The 560-mile run from Gorky to Moscow was covered easily in 14 hours.

The vessel is divided into three spacious and comfortable passenger saloons and there is also a promenade deck and restaurant.

Successful trials have now been concluded of a sea-going hydrofoil "Mir," which had its maiden voyage on the Black Sea.

This diesel vessel accommodates 92 passengers, can cruise at over 40 knots, and has a range of almost 400 miles.

The engines are remote-controlled and she is fitted with automatic steering. The all-welded hull is made from a light alloy.

It is reported that handling in a rough sea is first class.

The designers are now going ahead with designs for a larger vessel with a bigger range and accommodation for 300 passengers.

A rich bed of iron ore, nearly 700 feet wide and six miles long has been discovered near Skorodnoye.

The seam is about 65 feet thick, and only about 800 feet below the surface.

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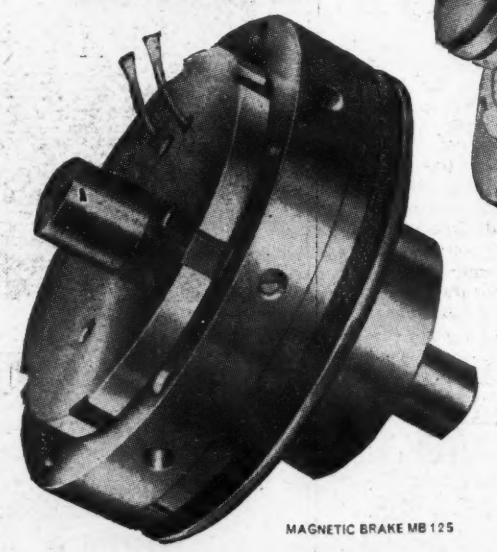

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PRISONS AIM AT WORKSHOP EFFICIENCY

By Our Parliamentary Correspondent

STEPS are being taken to increase the efficiency of prison workshops and to allow prisoners to earn more. But there is to be no attempt at present of attaining the goal of some prison reform experts and paying the union rate for the job.

This was stated by a Home Office spokesman, Earl Bathurst, during a Lords' debate last week on the problem of prison labour.

The Earl of Longford contended that the problem of finding sufficient employment for those in jail would never be solved until a proper wage for a full working week was given.

A start should be made in paying the rate for the job.

'Dismal failure'

Lord Stonham said the Prison Commissioners had "failed dismally" in the provision of work. If prisoners were paid the rate for the job, this would meet the major objections of unions and employers.

Earl Bathurst replied that a new earnings scheme, based on the recommendations of the Advisory Council on the Employment of Prisoners, was introduced in August.

The council recommended that the range of prisoners earnings should be extended and that they should be put on a piece-time basis as far as possible.

The scheme was useful but no attempt was being made to pay prisoners the rate for the job. The government had not closed their minds to the possibility of paying a full wage.

However, there were many other problem which had to be studied.

MODEL SHIPS TAKE ROUGHER TESTS

Concepts changed in 'energy-spectrum' ocean wave theory

PAPERS on sea-going characteristics of ships and their prediction by radio-controlled free-test models were presented at an N.P.L. seminar for ship designers at Teddington recently.

Two other developments were highlighted — improved testing tanks, and additional concepts in the "energy-spectrum" ocean wave theory based on statistical analysis.

Artificial waves

In a paper Mr. R. F. Lofft, Admiralty Experiment Works, details were given of two new manoeuvring tanks in which complicated wave patterns can be produced by wavemakers placed along two sides of the tank at right angles to each other. One is at the Ship Hydrodynamics Laboratory, Feltham, and the other at A.E.W., Haslar.

Most ship model testing is carried out in a long straight tank with long-crested waves confined to a single direction of advance.

The new tanks should more nearly simulate seagoing conditions such as may be encountered on the North Atlantic route.

Radio controlled

Without using a driving carriage, an entirely free radio controlled ship model carries operating, measuring, and recording equipment and will stop, start, and reverse the main propulsion motor, operate the rudder, and start and stop the recording equipment.

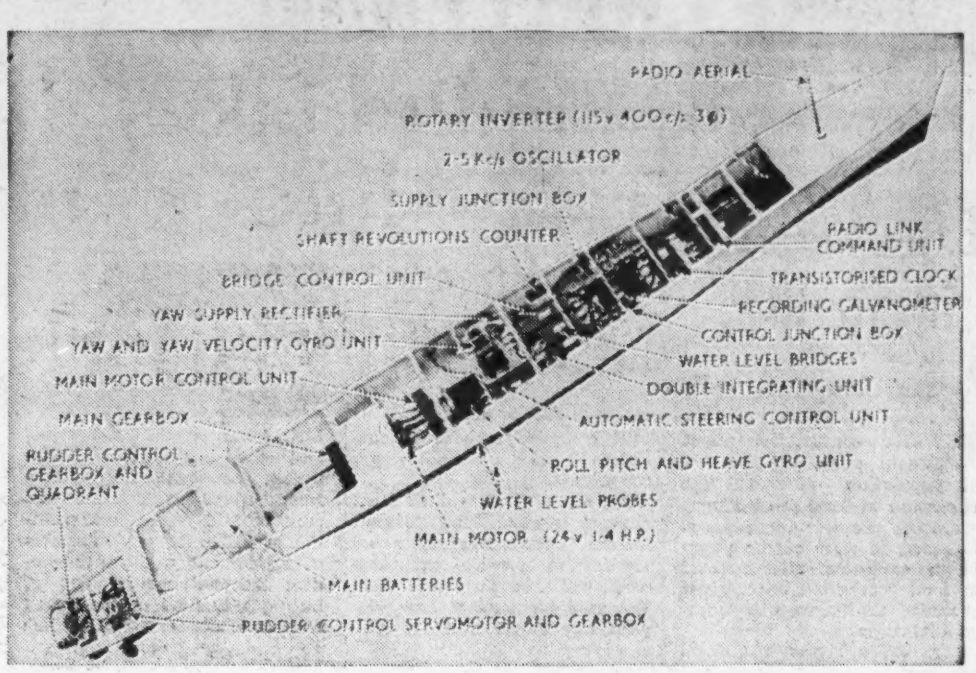
Pitch, roll, and yaw are measured by gyros and heave by a vertically mounted accelerometer, the output of which is integrated twice.

Wave profile is measured by capacitance probes on the model. Records from them are corrected for the vertical heaving motion of the model.

The wavemaking machines at the Ship Hydrodynamics Laboratory are coupled to a mixed frequency generator supplied by Evershed & Vignoles.

The complex wave surface can be expressed mathematically in terms of the energy spectrum theory which yields a logical explanation of the "chaos". This can be used for predicting seagoing conditions.

Delegates were given a demonstration of model testing techniques at the Ship Hydrodynamics Laboratory at Feltham. The tank there is a ¼-mile long, by 48ft. wide, by 25ft. deep, containing 9½ million gallons of water.



Accurately hand finished wax models are mostly used in these tests and one particular calibrated hull form made from glass fibre, developed by S.H.L., is exported all over the world for tank testing purposes.

TEST-ITSELF ANALYSER ORDERED BY RAF

A NUMBER of Honeywell Systems Analysers have been ordered by the RAF for testing complex electronic systems of the English Electric "Lightning", it was announced this week, by C. W. Spangle, managing director of Honeywell Controls.

This is the first Air Ministry contract for this equipment.

Electronic systems are checked individually and in combination with each other.

The Analyser—which is able to test itself—performs its tests from punched-tape information. Required test programme is placed in the tape reader and operational manoeuvres are simulated, the system indicating whether the circuits are performing correctly.

The object of the tests is to isolate faults and trace them to a system "black box" or replaceable unit.

These units have been in actual operation in the U.S. for over two years on automatic maintenance support of the F-101.

Hoverbus on Loch Lomond

COMMERCIAL production of hovercraft is being launched by Denny Hovercraft, a newly-formed company at Dumbarton, with the initial manufacture of four machines each capable of carrying 50 passengers.

A hoverbus will possibly be used on Loch Lomond next summer, carrying fare passengers.

Denny have been active in this field for some time, and have demonstrated their unit on the Clyde recently.

WANTED: IDEAS

WAYS of increasing the flow of ideas from employees and revitalising suggestions schemes were discussed at a conference of the Industrial Welfare Society in London on Friday.

Mr. L. A. J. Gazeley of the A.C. Delco Division of General Motors pointed out that high pressure publicity stimulated the flow of ideas but the quality fell off rapidly.

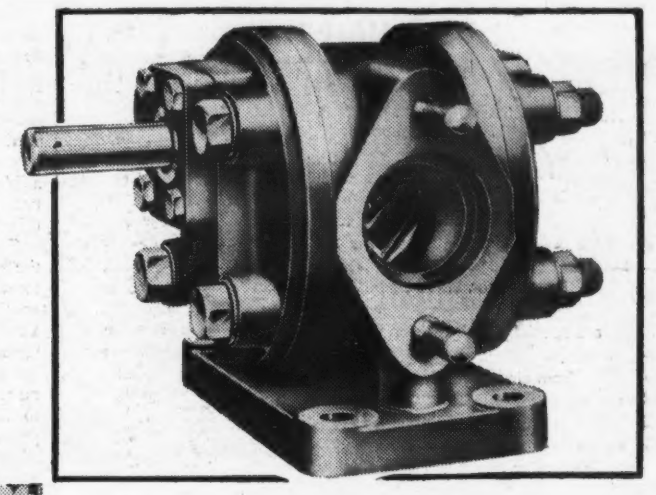
Posters, changed frequently to renew impact, were the most reliable stimulants.

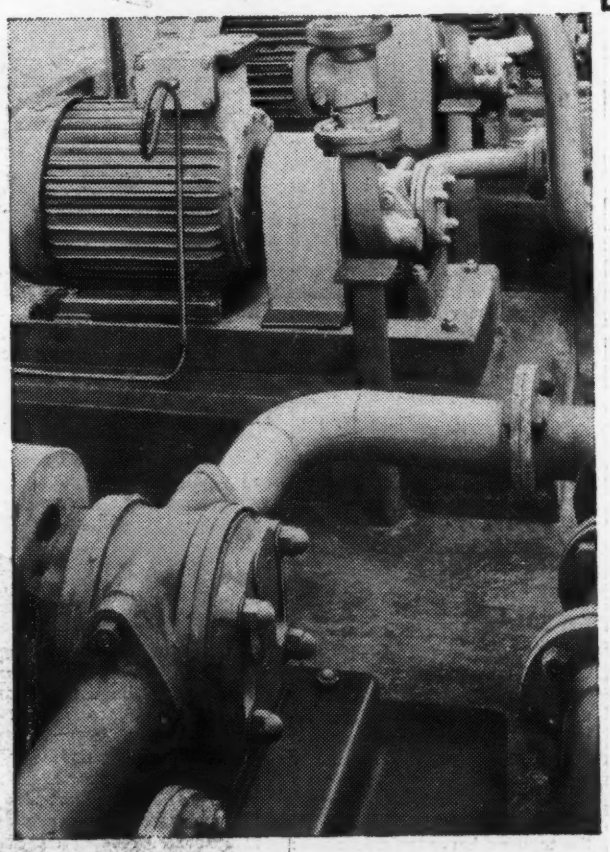
It was a mistake to place incentive on too high a plane as this tended to discourage lower paid workers by making them feel that their chances of winning were too remote.

Hitachi in Germany

THE Hitachi Machinery Co., one of Japan's largest firms, is setting up a number of branches in West Germany. The company will concentrate on selling precision machine tools. The main representative in Northern Germany will be Heinrich Boesch GmbH of Hamburg-Altona.

When smooth pre-determined flow is essential..





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AUTOMATION NOT YET ECONOMICAL

— by —

Ewen M'Ewen,
Director Engineering (Europe), Massey—Ferguson Ltd.

UNTIL recently, for about twenty years, the increase of population outstripped the expansion in food production.

During the last three years, however, in spite of the population explosion, the increase in food production has slightly exceeded the increase in world population.

Distribution around the world continues to be most uneven, and food surpluses which have been apparent for many years in highly developed countries continue to exist alongside near-famine conditions in underdeveloped countries.

But even if the distribution problem is solved, the challenge for the agricultural engineer will remain: to provide equipment which will lower the cost of food. The need for food at any price gives way to the need for food at a low price.

In the UK, successive governments have subsidised farmers to provide cheaper food.

Subsidised or not, however, the U.K. farmer is the most highly mechanised in the world. Nevertheless, the drift of population from the land continues and there must be still further mechanisation to enable the smaller number of agricultural workers to produce the maximum amount of high quality food at the lowest cost, at the same time building up and not destroying soil fertility.

In an age of change, even farming techniques must alter though this is an industry steeped in tradition.

Change may, in some cases, involve a departure from what has previously been considered good farming; for example, the British farmer has no proof that his efforts to keep the furrows straight, neat and tidy results in any increase in yield and indeed a North American farmer would not pay too much attention to this kind of detail.

Furthermore in many parts of the world, much more thought must be given to controlling soil erosion in order to bring back acres into food production which have been lost to wind and water.

Agricultural research establishments still have a tremendous task to fulfil in the provision of improved fertilisers and the breeding of plants to give increased yields, at the same time being resistant to disease and changes in climate.

Difficult conditions

It is widely thought that farm machinery can be designed by anyone since it has none of the glamour of aviation or missiles and, in the past, reasonably satisfactory machines have been produced by crude techniques and a great deal of trial and error.

It is worth while to note, however, that in no other industry does machinery have to operate in such a wide variety of difficult conditions: soil may vary from heavy to light, from friable to sticky, abrasive to stony, while crops can be inconsistent in height, weight, shape and weed content.

In addition to this must be added the greatest variant of all—the weather.

A farm machine, which must be cheap and must be reliable, is expected to operate with the minimum of maintenance under conditions of dust and mud, stone and rubbish, and with an almost unbelievably low degree of skill.

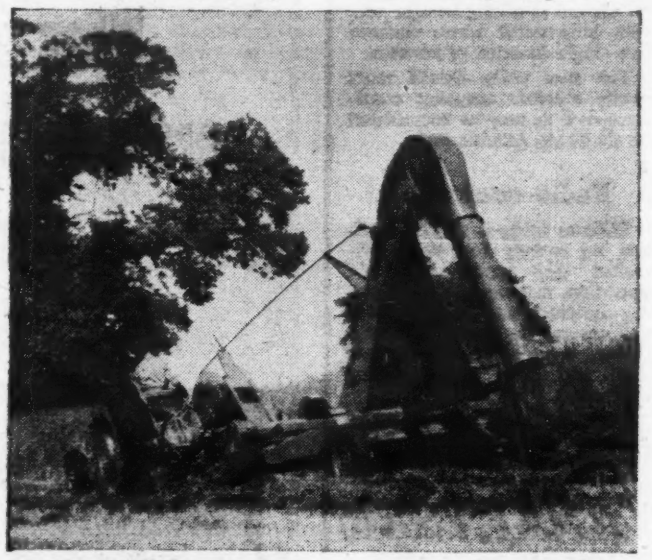
In spite of all this, farm machinery manufacturers are required to produce more efficient machines, operating at faster speeds, and utilising less manpower.

Sometimes, as in the case of the combine harvester, this can be accomplished by the design of a machine to perform two or three operations at the same time but the experience of the industry is that multi-purpose machines are seldom a success.

Damage to crops

There is more and more a division between special purpose machines and general purpose machines. Farm machines should be as simple as possible, trouble-free and safe — and should have the lowest possible maintenance.

In addition, the damage done by the machine to the crop can be a serious factor; both potatoes and sugar beet still suffer considerable damage under mechanical handling and only the highest quality vegetables are nowadays acceptable.



It is not so much what you grow as what you harvest that counts—and farm machinery must contribute to a better harvest.

During the development of farm machinery, the manufacturer must take into account the requirements of various markets in which he hopes to sell the machine so that advantage may be taken of volume production to reduce the price of the machine.

Product planning

One of the major problems in farm machinery design is to get the correct specification in the first place, that is to say to have adequate product planning.

In view of the wide range of conditions in which farm machines have to be used exhaustive tests have to be carried out with experimental prototypes.

In many underdeveloped countries, usage is a real difficulty, especially since the actual operator may be, and frequently is, incapable of reading the instruction book.

Something can be done in this respect by the use of the strip cartoon technique but it remains one of the most difficult problems to be faced in getting the maximum utilisation of farm machinery to reduce the costs and increase the production of food.

In this respect, also, an efficient and comprehensive service organisation has its own particular difficulties in backward areas.

The last quarter-century has seen a revolution in the application of machines on a farm. The farm work-horse has largely disappeared from many countries and there is no doubt that two of the most important innovations within this time have been the advent of the light-weight tractor fitted with three-point linkage hydraulic controls pioneered by Mr. Harry Ferguson and the self-propelled combine harvester pioneered by the Massey-Harris company.

Other important developments during this period have been the advent of the forage harvester, the development of precision seeders, the extensive use of chemical sprays for weed and disease control, and the increasing popularity of silage.

There have been substantial advances in the handling of farm products; improvements in farm buildings, and further improvements in mechanical handling will probably be one of the major features of the next few years.

There is unlikely to be a major revolution in tractor design in the near future, though there is a tendency for more horse-power to be available, for fuel consumption to be reduced, and for more advanced transmissions with many speeds. It does not appear probable, however, that these changes will result in any major economies.

Higher productivity

These can only be effected by increasing the output of the man on the tractor or, indeed, by eliminating him altogether.

There has already been talk of radio-controlled tractors and automatic operations programmed in advance. These are already technically feasible but economically not yet attractive.

For the shorter term, to increase productivity it is essential for every farming operation to be separately analysed and methods investigated to ascertain whether the operation can be speeded up or combined with another—or eliminated altogether.

For example, high-speed ploughing might be combined with the preparation of the subsequent seed bed.

The challenge to our industry is to provide machines which will enable the man to do more work in a day—for the cost of the end product is the cost of the labour which went into producing it.

4 NOISE REDUCTION OF ELECTRIC MOTORS

Burgess combined air inlet and exhaust silencers are specially designed for reducing the noise from air cooled electric motors to an acceptable level. These units also provide weather protection, and can be fitted with filters if required.

SILENCE IN INDUSTRY

Write for full technical information from:
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.....FOREIGN NEWS.....FROM OUR OWN CORRESPONDENTS....

THE STORY BEHIND MR. K's BOMB

Early days of atomic energy

MOSCOW

A RECENT article in Pravda has given a revealing history of the Soviet Atomic Energy Industry, the power behind Mr. Khrushchev's recent threat to explode a 50-megaton bomb.

The article deals with the life and achievements of I. V. Kurchatov, the Russian atomic scientist who died last year.

Kurchatov, born in 1903 in a small village in the Urals originally intended to become a ship designer; whilst studying for this he earned his living as an observer in the Pavlovskii Magneto-Meteorological Observatory, Leningrad.

Abandoning his original aim he moved on to high-voltage physics and about 1936 worked in the new Physico-Technical Institute in Kharkov on high-voltage apparatus for splitting the atomic nucleus.

EUROPE'S FIRST CYCLOTRON

On returning to Leningrad he started up the first cyclotron in Europe at the Radium Institute and thereafter began the construction in the Leningrad Physico-Chemistry Institute of a large cyclotron which at that time was the largest in Europe—and this before the Second World War.

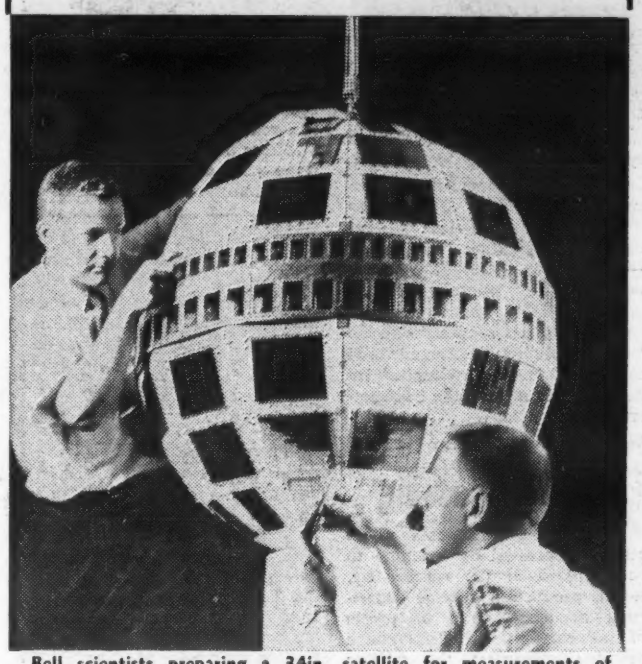
The writer of the Pravda article also claims that in 1934 Kurchatov established the fact of the branching of nuclear reactions apparently using phosphorus and aluminium. This was followed in 1935 by the discovery of the isomerism of artificial radioactive nuclei.

It appears that at some time around 1938 Kurchatov began the study in his laboratory of a high-speed neutron chain reaction.

In November 1940 Kurchatov read a paper at an All-Union Conference on Atomic Energy entitled "The Splitting of Heavy Nuclei" which was published but —and this seems fantastic in retrospect — was ignored in the West.

In the summer of 1943 Kurchatov was summoned to Moscow by the Soviet Government and ordered to establish a special laboratory to work on the splitting of the uranium atom. This work, aided by such information as was provided by Nunn, May and Fuchs (although no credit is given in the article) resulted in the Russian atomic bomb explosion of 1949.

SOLAR CELLS FOR TV SATELLITE



Bell scientists preparing a 34in. satellite for measurements of antennae characteristics.

NEW YORK

AN active communications satellite, intended for experiments in the overseas relaying of telephone calls, television signals and other communications systems, is being prepared at Holmdel, N.J., by Bell Telephone Laboratories.

It is planned to launch the satellite into orbit next spring.

Arrays of solar cells, used to convert sunlight into electricity, cover most of the surface of the 34-in. diameter shere. Strips of man-made sapphire cover the cells for protection against radiation.

Microwave radio receiving and transmitting antennae form the belt around the mid-section of the satellite.

The laboratory at Holmdel contains a specially-constructed test chamber designed to simulate the radio environment of space.

Aluminium works to boost N.Z. income

WELLINGTON

ALMOST £77 million will be needed to build a power house at Lake Manapouri and an aluminium smelting plant near Invercargill.

This was said by Mr. C. E. Gardner, chief power engineer for Comalco, addressing an annual conference of the Secretaries' Association of the Electrical Supply Authorities Association.

He said plans announced by Comalco anticipated that aluminium would be produced at the smelting factory by 1966 and that when the smelter was in full production the plant would be capable of producing 120,000 long tons of aluminium a year.

The power house at Lake Manapouri would be in the west arm of the lake and situated 750ft. underground.

Four generators

Ninety to 100ft. high, 50ft. wide, and 350ft. long, the power house would contain four generators. Each generator would produce 100,000 kilowatts. The overflow from the turbines would be taken six and a half miles to the head of Deep Cove, in Doubtful Sound.

The aluminium plant would provide New Zealand with a major secondary industry, and many satellite industries would appear.

"The world demand for aluminium is expected to double in the next 10 years and the Invercargill smelter is assured of markets to help to meet the expected deficiency in production as demand begins to exceed supply", said Mr. Gardner.

The two logical market areas are India and Southeast Asia.

£A16m ON RESEARCH

SYDNEY

THE Australian Government had spent £A16 million by the end of June on the Atomic Research Establishment at Lucas Heights, near Sydney.

The main line of research is directed towards a high-temperature, gas-cooled reactor system.

At present 850 people are employed at Lucas Heights.

Wood-steel beam

STOCKHOLM

SWEDISH engineers Arnold Skoog has succeeded in producing a wood and steel laminated beam.

The beam, called IAS, is made in a I profile, which is stress and compression reinforced with thin filaments of hard steel glued between the wood layers.

By using the IAS-beam, it is possible to save up to 70 per cent of material, compared with a homogenious wooden beam. With IAS beams it is possible to build over spans of 65 yards.

The beams are in full production by **A. B. N. Johnson & Co., Eslov, Sweden.**

ECONOMIC USE OF WET ORES

NEW YORK

BY a newly patented method, millions of tons of previously unusable iron ores in the Lake Superior region are available for blast furnace processing into pig iron.

The method, developed by the Bethlehem Steel Co., permits certain wet iron ores, containing as much as 15 per cent water, to be used economically in steel-making. The wet ore is mixed with dry flue dust, coke or sinter particles to reduce the water content to 7½ per cent.

Water content

Reducing the water content results in a mixture that may be passed over sintering screens. Particles larger than 3/16in. go directly to the blast furnace, while smaller particles are formed into pellets and sintered with fine coal or coke dust.

What is so special about the 'AIRSPIN' ROTARY CUP FUEL-OIL BURNER?

It is a high speed turbine driven burner designed by Edwin Danks of Oldbury.

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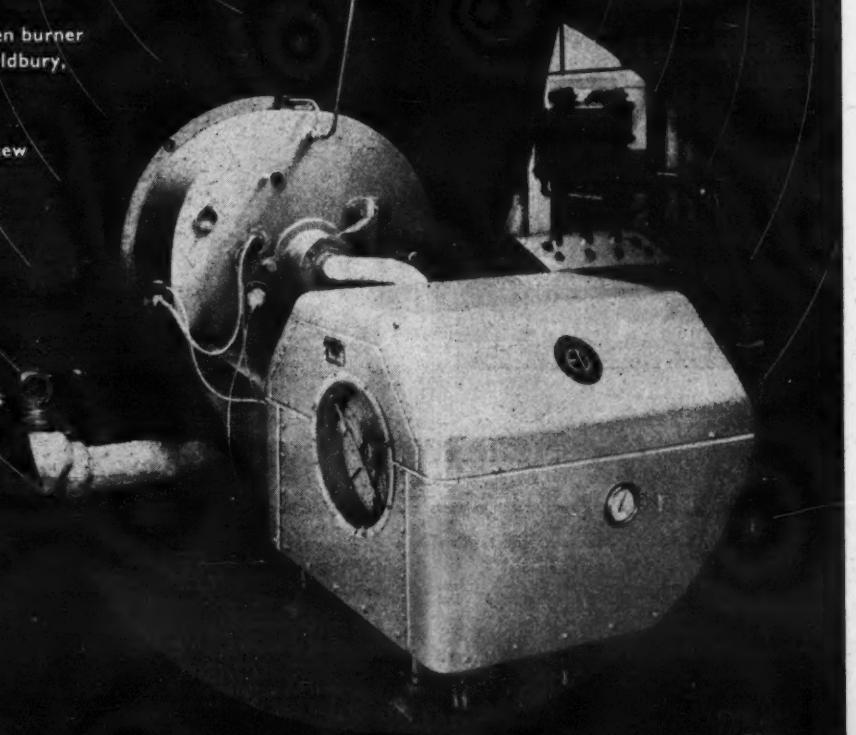
Many other advantages are described and illustrated in Publication No. 1752. Please send for your copy to Edwin Danks at Oldbury or the nearest Branch Office.



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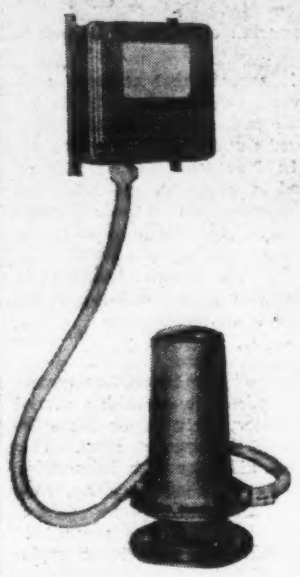
NEW Equipment

Resistance operated level indicator

NO restriction is placed on the length of probe which may be employed with Autodip level control equipment; it is thus particularly suitable for applications involving deep containers. It can be used with most electrically conductive liquids.

Fail to safety features are inherent in the design of the unit and operation depends on the change in resistance which occurs as the liquid moves up or down the probe. It will operate over the resistance range 0-500,000 ohms. **Lancashire Dynamo Electronic Products Ltd., Rugeley, Staffs.**

Reader service reference No. 99



LEVEL INDICATOR
For deep tanks

Web tension control

A hydraulically operated system for the control of tension of any fast moving web, either paper or extensible plastic, has been developed for machines with an existing hydraulic drive. The patented tension controller used will detect any variation in tension causing a thrust pin to move 0.005in. or more.

Hydraulic signals from the controller are fed to a servo operated relief valve, which in turn regulates the pressure applied to the hydraulic motor driving the next section of the machine. Although the system is highly sensitive, it is claimed not to cause flutter or to "hunt". **Hydraulic Machinery Drives Ltd., 101 London Road, Reading, Berks.**

Reader service reference No. 100

Oscilloscope system

Plug-in amplifier units allow the Telequipment D33 oscilloscope, a light, portable instrument, to be used for a very wide range of applications. There is a basic range of amplifiers available, or special units can be supplied to individual requirements.

Of the basic range, amplifier A is a general purpose unit with a wide frequency response and capable of providing X 10 sensitivity over a limited bandwidth. Amplifier B is a differential amplifier unit giving high gain: maximum sensitivity is 1 mV/cm. d.c., frequency response 200 Kc/s. Unit C, an ultra high gain amplifier, has maximum sensitivity as high as 100 μV/cm. a.c., frequency response 5 c/s. to 150 Kc/s. **Telequipment Ltd., 313 Chase Road, Southgate, London, N.14.**

Reader service reference No. 101

Pallet truck

A hydraulic lift of from 3¼in. to 7⅓in. and a load capacity of 2,600 lb. are among the features of the Vertopal pallet truck. It will take either single or double decked pallets and various sizes of truck are available, overall widths being 21in. or 27in. and lifting arm lengths of 36in. or 48in.

The twin steering wheels are of reinforced plastic and can be turned through more than 180 deg. They are also articulated to maintain stability on uneven floors. Load arm wheels are of aluminium as standard although cast iron wheels all round can be fitted to order. The load arms themselves have tapered ends and are inclined slightly downwards to give easier entry. The handle can be left in an upright position where it locks itself by means of a spring-loaded plunger. **Powell & Co., Burry Port, Carms., S. Wales.**

Reader service reference No. 102

Fire extinguishers

With greater capacity than previous models, the Nu-Swift Plus range of pressure charge operated extinguishers are claimed to be the first ever licensed to carry the Kite Mark of the British Standards Institution. They contain either chlorobromomethane or carbon tetrachloride with carbon dioxide added. Charges for the old types of extinguishers will continue to be manufactured for at least ten years.

Reader service reference No. 103

Sound level meter

A frequency response similar to that of the human ear is obtained by the use of three filter networks in the Dawe type 1408D sound level indicator. The instrument is fully transistorised and weighs 14 oz. complete with dry batteries, which have an operating life of 80 hours. Range is 64 to 110 dB., said to be adequate for most industrial applications.

SOUND MEASUREMENT
Same response as ear

The built-in crystal microphone remains unaffected over the temperature range 0-45°C. Overall dimensions are 6in. by 3in. by 2¼in., the instrument is housed in a plastic casing, and a leather carrying case and shoulder strap are supplied. **Dawe Instruments Ltd., Western Avenue, London, W.3.**

Reader service reference No. 104

Coolant filter

A high efficiency of filtration makes the pressurised coolant clarifier which has been added to the Philips range of coolant filtration equipment especially suitable for precision grinding operations where a particularly good finish is required. The inlet system is said to keep the filter medium clear until the filter is completely blocked up.

Sludge capacity is 10 gal. and replacement filter elements cost 20s. each. A ½-h.p. pump is incorporated, eliminating the need for a coolant pump on the machine which it feeds.

Floor space required, with a standard 50-gal. tank, is 2ft. 6in. by 4ft. 9in., and the only connections necessary are the mains supply and flexible hose to the machine tool.

Reader service reference No. 105

Manipulator

Many problems encountered in the handling of very small parts can be solved by the use of the Vacuum Tweezer system.

The operator holds a vacuum pencil unit fitted with a stainless steel pick-up tip and covers a hole with his thumb to work the suction.

The vacuum generator is electro-magnetic in design and operates from an a.c. mains supply; it has an adjustable pressure control. Various shapes and sizes of pick-up are provided. **Technical Designs Ltd., 86 Edgware Road, London, W.2.**

Reader service reference No. 106

Bearing air gauge

An air gauging equipment specially designed to check the wall thickness of plain bearings, cylindrical bushings and similar parts has been developed. It will measure components from 1½in. to 7½in. internal diameter, with wal thicknesses up to ⅝in., and can check concentricity between internal and external diameters by measuring the variation in wall thickness as the component is rotated in the gauge.

Open gauging nozzles which do not contact the work piece are used so that there is no danger of marking the work. Adjustable support arms are fitted but these play no part in the measuring process, merely supporting the work in the gauging position. Setting up can be performed either with slip gauges or a work piece of accurately known size. A pneumatic span-setting master is built into the gauge and pneumatic calibration can be checked by turning a knob.

One of two measuring ranges may be specified: 0.001in. to +0.001in. with 0.0001in. calibrations (magnification 1,800), or —0.0002in. to +0.002in. An air supply at any pressure between 60 and 150lb./sq. in. is required and the gauge is supplied with air filter, supply pressure gauge and connecting hose. **Teddington Industrial Equipment Ltd., Sunbury-on-Thames, Middx.**

Reader service reference No. 107

Data processing

By allowing documents which can be processed by machine to be prepared at the source, e.g. stores, production control department or other point of origin of information, a Printapunch machine eliminates the writing and separate punching of source documents.

It also avoids errors introduced into data processing systems by the transposition of information when manually key punched.

The machine uses code holes in embossed plastic or metal plates to punch significant data into prescored tabulating cards using standard punching code.

Simultaneously the machine will punch constant and variable data into the cards and imprint information from the embossed plates. **Account-Tokens Ltd., 42 Fords Park Road, London, E.16.**

Reader service reference No. 108

Fume cleaning plant

Removal of 99.6 per cent. of solids in the range five to 0.01 microns is claimed for Ambuco venturi scrubbers made in this country under licence from Waagner-Buro of Austria.

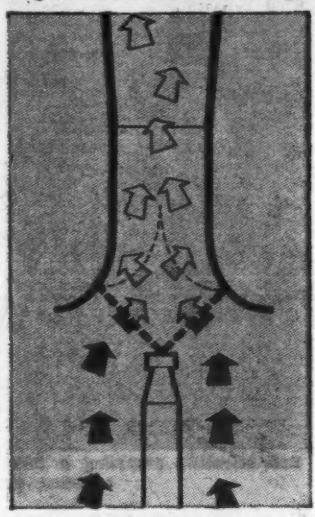
The technique employed in these scrubbers is of value for such diverse applications as metal smelting and refining, chemical manufacture and sand grading.

The basic principle of operation is that the fumes are passed downwards through a double cone of water formed by a spray at the top of a venturi tube.

The entrained particles are separated from the fumes and carried in the water to a hopper beneath, while the clean fumes pass through the top of the hopper and are expelled to the exhaust stack by way of a fan.

The solids extracted settle in the hopper and may be drawn off periodically or continuously, and either disposed of with other liquid effluent or passed through a filter for reclamation or disposal.

A transportable pilot plant has been constructed to demonstrate this venturi scrubbing process and a feature of this plant is that there is no scale effect as it employs a single full-size venturi tube, larger installations, capable of handling as much as 200,000 cu.ft./min., being built up by assembling groups of the tubes. **Ambuco Ltd., Standbrook House, 2 Old Bond Street, London, W.1.**



FUME CLEANING PLANT
Double scrubbing

Reader service reference No. 109

READER GUIDE

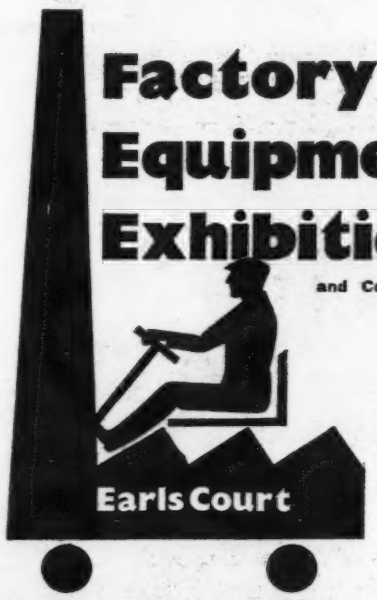
ON this page we publish the latest information on new equipment of interest to engineers.

Included: Inspection and test equipment, production machinery, factory plant and measuring and control equipment. Fill in the Reader Service Card on page 18 for further details of any items on pages 16 and 17.

INTERNATIONAL

Factory Equipment Exhibition

and Conference



VISIT

THE SECOND Engineering Materials and Design EXHIBITION and CONFERENCE

EARLS COURT

AT THE SAME TIME

The Factory Equipment Exhibition is recognised as the ideal means for keeping busy executives abreast of current developments in production, construction and maintenance, covering the needs of every type of factory, large or small. In no other circumstances can so great a variety of plant and equipment be viewed so conveniently and pleasantly.

13th.-18th. NOVEMBER 1961

Daily — 9.30 a.m. to 6 p.m. Last day — 9.30 a.m. to 4 p.m. Children under 15 not admitted

This year, for even greater convenience, exhibits are grouped in the following fourteen main sections:

Handling, Storage and Partitioning
Office and Drawing Office Equipment and Systems
Packaging and Packing
Workshop Machines, Tools and Equipment
Air-conditioning, Dust and Fume Extraction, Heating, Power, Ventilation, Insulation and Refrigeration
Industrial Finishing and Anti-corrosives
Finance for Industry
Factory Construction, Furnishing, Cleaning and Maintenance
Automation, Instruments, Electronics and Communications
Power Transmission, Hydraulics Pneumatics and Lubrication
Security, Safety and Fire Protection
General Industrial Equipment and Services
Canteen Welfare and Automatic Vending Machines
Protective Clothing

EXHIBITION CONFERENCES

Concurrently with the exhibition the British Productivity Council is organising a series of conferences entitled "Efficiency in Today's Factory" and "Producing for European Markets", and the Automatic Vending Machine Association will stage a conference on "Automatic Vending in Industry".

PROTECTIVE CLOTHING ON PARADE

A parade of the latest industrial protective clothing with accessories is being staged three times daily. The parade will be accompanied by expert commentaries and will provide an invaluable guide to safety and welfare officers and other buyers of protective clothing.

Sponsored by the LONDON CHAMBER OF COMMERCE, the "FINANCIAL TIMES" and "INDUSTRIAL EQUIPMENT NEWS". Organised by Industrial & Trade Fairs Limited.

For further information apply: The Administrative Office, International Factory Equipment Exhibition, Industrial & Trade Fairs Limited, Commonwealth House, New Oxford Street, London, W.C.1. Telephone CHAncery 9011

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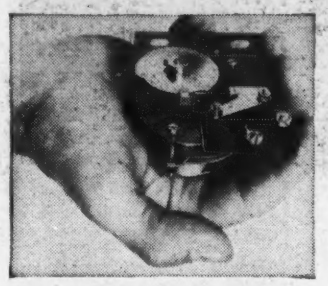
NEW Components

Miniature timer for quantity markets

SIMPLICITY of construction allows this miniature synchronous timer to be offered at a relatively low price compared with some of the more refined units available. It is intended for such applications as the automatic control of oil firing equipment.

The timer can close one circuit for a specified interval during a fixed, repeating time cycle or can be wired to give single cycle and stop operation. A wide choice of time cycles can be arranged from 3 seconds to 24 hours and the switch rating is 5 amps at 250 volts a.c. or 24 volts d.c. Overall dimensions are 2¾in. by 2⅞in. by 2½in. and the weight of the unit is approximately 11¼ oz. **Electrical Remote Control Co., Ltd., Bush Fair, Harlow, Essex.**

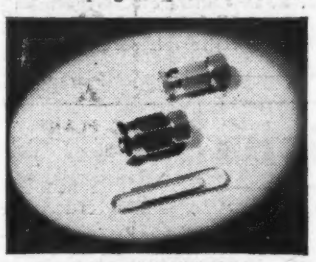
Reader service reference No. 110



MINIATURE TIMER
Choice of time cycles

R.F. Connectors

These cable plugs, Conhex types 3040 and 3050, have larger bodies and clamping components than the



R. F. CONNECTORS
For larger cables

standard Conhex 75-ohm series, although they will mate with the 75-ohm receptacles and jacks. They have been produced to accommodate some of the older miniature R.F. cables which are considerably larger in diameter than the latest subminiature cables. **The Sealectro Corporation, Hersham Factory Estate, Walton-on-Thames, Surrey.**

Reader service reference No. 111

Dust extraction

With a minimum bend radius of ½in., Macduct dust extraction hose can be bent or twisted into almost any position without appreciable loss of cross-sectional area. It is made of 1/32in. abrasion resistant rubber with a high tensile wire reinforcement and an outer covering of rubberised canvas. Size range is from 2in. to 8in. and the hose can be used for the extraction of abrasive dust from grinding operations, sawdust, or wood chips.

Made in standard lengths of 20ft. without cuff ends, it can easily be cut to length and fixed with a worm drive clip. Cuff ends can also be supplied to customers' requirements. **George MacLellan & Co., Ltd., Shuna Street, Maryhill, Glasgow, N.W.**

Reader service reference No. 112

Solid frame motors

A series of heavy duty d.c. motors which are electrically and mechanically interchangeable with mill type motors to A.I.S.E. standards, but of solid frame construction, has been introduced. Dreadnought motors, as they are to be known, are intended for applications where the high cost of split frame construction is unjustified, since it is frequently as quick and convenient to replace a complete motor as to withdraw and replace an armature.

Brush gear is carried on a rocker so that access to all brushes can be obtained from a cover on one side of the machine. The range covers the same outputs as the A.I.S.E. motors, up to about 200 h.p., and the machines are available either totally enclosed or forced ventilated. **Laurence, Scott & Electromotors Ltd., Gothic Works, Norwich.**

Reader service reference No. 113

Chargeable battery

A battery the size of two standard U2 cells, available with ratings of 2.5, 3.5 5 or 6 volts, and capable of being charged directly from mains supplies, has been introduced. The life between charges is claimed to be the same as that of replaceable batteries. It is encased in plastic and may be left for months without fear of corrosion because the storage section is hermetically sealed and contains no chemicals which could corrode metal.

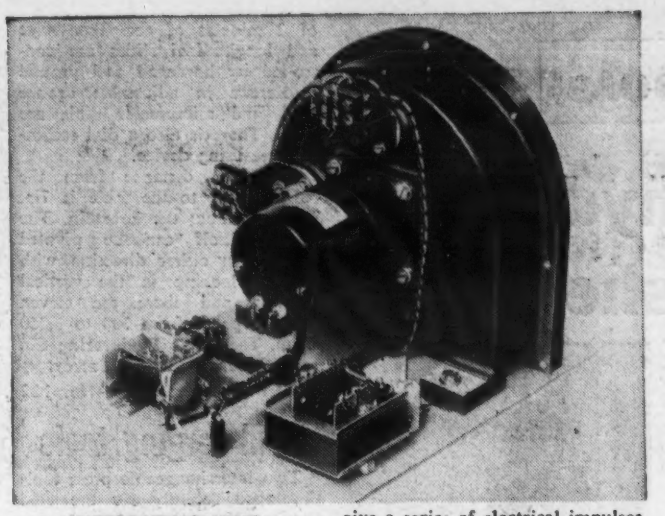
Removal of a cap on the battery switches in an internal rectifier, isolates the battery electrically, and exposes two pins which can be inserted in a standard 5-amp socket. **Electronics and Automation (London) Ltd., Maxwell House, Arundel Street, W.C.2.**

Reader service reference No. 114

Integrating unit

It is now possible to obtain a complete electromechanical integrator incorporating Electro Methods' series 5300 integrating motor. Typical applications include conveyor load weighing, total flow recording, and other processes where an electrical signal has to be integrated with respect to time, and it is possible to arrange digital readouts.

A wide range of counting rates can be accommodated and direct readings of the quantity being integrated can be obtained, e.g. tons, gallons, coulombs.



INTEGRATING UNIT
Can give digital readout

A standard gearbox is fitted to the motor and the output used to drive a shutter with a number of holes in it. This shutter rotates between a lamp and a photocell to give a series of electrical impulses which can be amplified if necessary. **Electro Methods Ltd., Industrial Control Division, Caxton Way, Stevenage, Herts.**

Reader service reference No. 115

Elapsed time meter

Latest version of the C. & P. elapsed time indicator has a voltage stabiliser system based on a Zener diode within the instrument.

Although intended for a 6-volt d.c. supply, the indicator will, for example, operate at voltages varying between 16 volts and 30 volts on a nominal 24-volt d.c. supply.

The mechanism of the indicator is suspended on four leaf springs and this assembly is installed in a steel outer case with electrical contact made through insulated terminals at the rear

The voltage stabiliser system has been incorporated without increasing the dimensions of the instrument. **Cass & Phillip Ltd., Mark Road, Hemel Hempstead, Herts.**

Reader Service reference No. 116

NEW Materials

Refractory shapes for load bearing

A MANUFACTURING method which breaks away from traditional methods has been developed for the Kingscliffe '23' range of refractory insulating bricks and shapes. They are claimed to be particularly suitable where high load-bearing strengths are required and have a service temperature of 2,300°F.

In the traditional process for making refractory bricks, a mixture of clay and a combustible material are fired in a kiln to produce an oversize block which is machined to produce the finished brick. The Kingscliffe method consists of blowing pulverised clay containing about 8 per cent carbon into an oil-fired furnace operating at 1,300°C. The jets through which the clay is blown are set tangentially so that a spinning motion is induced in the hot gases and clay. The clay particles tend to agglomerate on the furnace walls and are transformed into pyro-plastic masses which fall on to a conveyor. The resulting compound is then crushed, mixed with a special solution and fed to a brick-making machine. **Kingscliffe Insulating Products Ltd., Wrexham.**

Reader service reference No. 117

Tougher link belt

A sheeting made from a blend of cotton and man-made fibres, vulcanised with a synthetic rubber, is used in the construction of Brammer Plus vee-link belting, and this combination is said to give a product which is stronger, will transmit greater horse power, and have a longer life than previous link belts, and in addition is heat and oil resisting. For identification purposes the belt is made in a red colour and the studs are also coloured in accordance with belt section. **H. Brammer & Co., Ltd., Hudson Road, Leeds, 9.**

Reader service reference No. 118

Spray phosphating

A phosphating solution which can be applied at room temperatures with an ordinary spray gun is now available.

Spray Gun Bonderite, as it is called, is intended for use on sheet steel and its applications include specialist production and small numbers of components which are too large or awkwardly shaped to be treated in orthodox phosphating plants.

The solution is sprayed on with a normal clean spray gun and left in contact with the work for between 2½ and 5 minutes before rinsing with cold water.

Spray Gun Bonderite solution can also be applied by brush. **The Pyrene Co. Ltd., Metal Finishing Division, Great West Road, Brentford, Middlesex.**

Reader service reference No. 119

Vibration damping

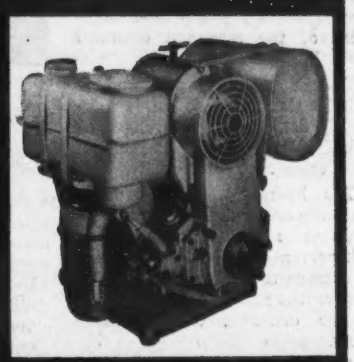
Two forms of a structural damping material called Hycadamp are available: one as a metal-rubber-metal sandwich produced in sheets up to 6ft. by 3ft., the other a metal sheet faced with rubber up to 2ft. square.

Both forms of Hycadamp are recommended for extending the fatigue life of metal structures and components, and they can be sheared, punched or routed, and bonded, bolted or riveted to conventional materials. **Fireproof Tanks Ltd., The Airport, Portsmouth.**

Reader service reference No. 120

IF YOU MAKE PORTABLE PLANT

MAKE IT MORE PORTABLE with JLO



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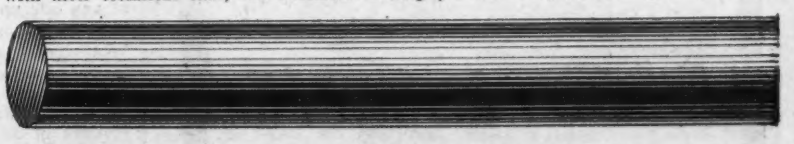

if you would like a copy of our latest brochure indicating our complete range of specifications, with full details of chemical analyses and mechanical tests, we would be pleased to let you have a copy.

KIRKSTALL

KIRKSTALL FORGE ENGINEERING LTD.
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READER ENQUIRY SERVICE

October 26, 1961

Please circle the reference number on the item on which you would like further details. Post to Reader Service Department, Engineering News, Heywood & Co. Ltd., Drury House, Russell Street, Drury Lane, London, W.C.2.

99	100	101	102	103
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114	115	116	117	118
119	120	121	122	123
124	125	126	127	128
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134	135	136	137	138

BLOCK LETTERS THROUGHOUT

Your name .....

Position .....

Department .....

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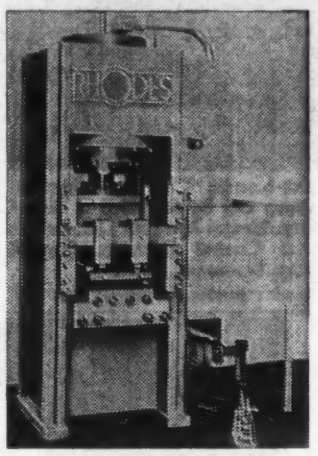
Nature of business .....

NEW Tools

Electro-hydraulic billet shears

BY the incorporation of electro - hydraulic actuation these Rhodes billet shears are claimed to give 100 per cent protection against overloading, and to allow any job to be tackled with complete safety for the operator.



BILLET SHEARS
Safety for operator

Fabricated steel is used for the press frame in place of castings and this not only makes for simple manufacture, but enables the machines to be built to meet customers' exact specifications. Long slideways give precise alignment of the ram and extended blade life.

Though primarily produced as a billet shear, the design is sufficiently flexible to be arranged as a hydraulic double-sided press at little extra cost.

The hydraulic gear is pneumatically controlled and a pressure relief valve in the hydraulic circuit prevents overloading and risk of damage to the machine; in this respect it is said to be far superior to the orthodox crank-operated shear.

A stroke of 5in. is provided on the machine illustrated and it has a rating of 150 tons. It will take 12in. by 1in. mild or stainless steel and can be set for single or continuous stroking. **Joseph Rhodes & Sons Ltd., Wakefield.**

Reader service reference No. 121

Light jig borer

Although a bench-mounted machine, the B.C.A. jig borer is designed to give accurate positioning of holes and for all types of light precision milling and drilling. The aim has been to allow many commonly encountered combinations of straight, angular and radial operations to be performed with little or no preparation or ancillary equipment.

Table diameter is 8in. and it can be rotated through 360 deg. by an enclosed worm and large diameter wheel, the worm spindle dial being graduated in divisions of 2 minutes of arc. Transverse and longitudinal slides are controlled by hardened and ground leadscrews in adjustable bronze nuts, and micrometer dials are fitted. There is also a dial indicator measuring device.

Maximum distance from the spindle nose to the table is 7in. and the throat depth is 8in. The spindle itself can be pivoted 30 deg. in either direction with positive locking in the vertical position and there are eleven spindle speeds from 300 to 3,250 r.p.m. **The Kline Engineering Co. Ltd., Salfords, Redhill, Surrey.**

Reader service reference No. 122

Cold forging tools

Two interchangeable press tools developed recently for the cold forging of steel components are said to represent a new approach to the process. The specially built presses required for cold forging are necessarily expensive and the use of multiple interchangeable tooling means that fewer presses are required, thus bringing the process within the reach of firms wishing to start cold forging on a small scale.

Of the two new tools, one is for cropping and flattening while the other is a three-stage forging tool. The cropping-flattening tool is mounted on a single base plate together with a bar-feed unit and a transfer mechanism for feeding the cropped blanks to the flattening station. Transfer mechanisms are also included in the forging tool, which consists of three individual cold forging tools arranged in line. Punch plate and bolster can be connected by dowel bars to allow the tool to be assembled and adjusted in the toolroom before being fitted fully prepared to the press.

An object of the design has been to facilitate the quickest possible tool changes, and the tools are meant to be used alternately on the same press. This not only reduces the capital investment necessary but allows the steel to be deformed more extensively than by other methods, for it has been found that a short time lag between operations improves the conditions for deformation. Production rate with this type of multiple tooling is between 30 and 75 strokes a minute. **Cold Forging Ltd., 29 Hanworth Road, Sunbury-on-Thames, Middx.**

Reader service reference No. 123

Guillotines

Hydraulic hold-down by means of individual plungers operated from a master unit is provided on the Rushworth series 38 and series 50 ranges of guillotines, which have mild steel capacities of 6ft. by ¼in. to 12ft. by ⅜in. and 6ft. by ¼in. to 8ft. by ¼in. respectively.

The machines have forward sloping slideways and a low rake angle of the top blade beams, features designed to give a clean-sheared edge. The blades have four cutting edges and are adjustable over their full length.

Standard fittings include two table brackets for the front and two side guides for the top of the table. Lighting is provided for the cutting area and there is a waste chute to push cut blanks away from the machine.

Speed of operation varies with the size of the machines from 33 to 50 strokes a minute. Depth of gap in all cases is 9in. **Rushworth & Co. (Sowerby Bridge) Ltd., Sowerby Bridge, Yorks.**

Reader service reference No. 124

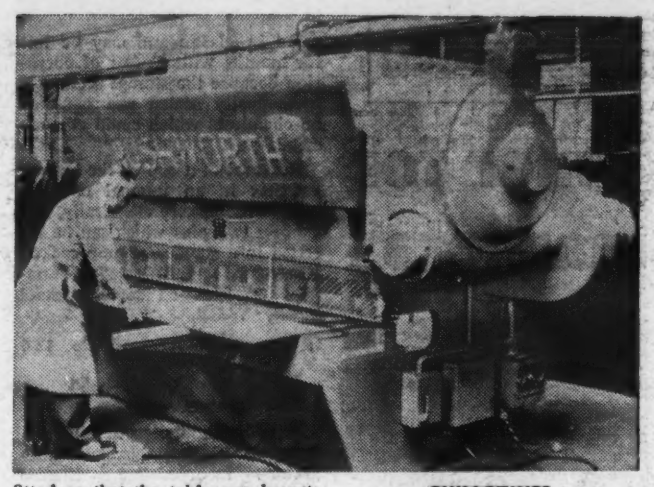
Flange drilling jig

Standard B.S.S. slip drill bushes of any size up to $^{25}/_{32}$in. diameter can be accommodated in the Weatherall flange drilling jig. It is of open-sided design with a removable centre table, and is said to be capable of taking components of any length, with the flange in any position on its shaft.

The table is fitted with a camlock dividing plate with 24 divisions as standard and with 360-deg. calibration. Plate and camlock are hardened and ground. A separate locking device is also fitted so that the table can be set in any position irrespective of the dividing plate. For normal use a spring detent with a positive spring action is incorporated.

The maximum flange diameter which can be accommodated is 16in. and the pitch circle diameter may be anything up to 10in. Maximum drill size is $^{25}/_{32}$in. diameter, minimum size no. 60 and maximum height under bush is 5in. Each jig is supplied with a set of standard slip bushes in one of three ranges. **A. Weatherall & Co. Ltd., Wallingford Rd., Trading Estate, Uxbridge.**

Reader service reference No. 125



GUILLOTINES
A series 38 model

Brick cutter

Slots up to 1¼in. wide and 1¼in. deep can be produced in brick walls at the rate of 6-8ft./min. by the Trend Wall Chaser, an electrically driven machine with two elastic cutting discs which are spaced according to the work in hand. The depth of cut can be quickly adjusted. Water is fed on to the wheels automatically in the form of a spray to keep down dust. One pair of wheels will slot up to 120ft. of fletton brick or 75ft. of a harder brick. **Trend Industrial Equipment Ltd., 77 Dudden Hill Lane, London, N.W.10.**

Reader service reference No. 126

Pneumatic nailer

A feed mechanism which automatically sorts and feeds the nails one at a time is provided with the Holz-Her portable pneumatic nailer, type NB-4. The tool has a maximum operating rate of 120 nails a minute. Nails from ¾in. to 1¾in. can be driven, maximum gauge being 18 and minimum gauge 14. The nailer weighs only 5¾ oz.

Nails are driven in with one blow, either straight or, by using an angular attachment, at an angle which enables the ends of the nails to be clinched in the same operation. A detachable gauging stop can also be supplied which ensures that the nails are all at a constant distance from the edge of the box or carton.

Air pressure required is dependent on the size of the nail and varies from 60 to 100lb./sq.in. Similarly air consumption is between 8¾ and 10½cu.ft./min.

The tool has many applications, including the manufacture of cases and crates of all types, cable

PNEUMATIC NAILER
Automatic feed

drums, wooden gratings and furniture. A larger model, type NB/7, is also available for nails from 1¼in. to 3in. in length. **J. K. O. Cutters Ltd., Hughenden Avenue, High Wycombe, Bucks.**

Reader service reference No. 127

MEEHANITE Regd.

Designing AND Planning For Quality Castings

using the Meehanite Recommended Procedures

These have been compiled for the guidance of designers, engineers and buyers in a recent bulletin. This publication contains useful and practical notes on Designing the casting, Selecting the metal, Choosing the pattern, and Planning for low-cost production. Readers of this bulletin will find it of value in obtaining high quality Meehanite castings.

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B10 Designing and planning for Quality Castings.

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NEW Publications

An enlarged and revised edition of the English Steel Corporation's pocket book **E.S.C. Engineers' Cutting Tools** has just been produced. It contains hints on the use and maintenance of drills, reamers, taps and milling cutters, and there are also some useful reference tables.

Reader service reference No. 128

Information on a new range of instruments is given in **Aetec Recording Pyrometers and Resistance Thermometer Recorders,** a brochure from Negretti & Zambra Ltd. The other new leaflets from this firm cover a vibration damping bracket for the Aetec instruments and centralised temperature indication for large buildings.

Reader service reference No. 129

Specification of both gas-fired and electric Efco-Lindberg Cyclone furnaces are given in a 12-page brochure published by Efco Furnaces Ltd. These furnaces make use of a forced convection system to blow heated air through the charge to give fast, even heating with no direct heat radiation applied to the charge. They are designed for temperatures up to 700°C. although Super Cyclone models are available for temperatures up to 950°C.

Reader service reference No. 130

A monthly review of plastic coating processes — **Dohmpowder News**—is to be issued to all interested in the plastic coating of metals by the fluidized bed and flame spraying techniques. The first issue gives technical information on these processes and details of some recent applications.

Reader service reference No. 131

Capable of studying the performance of complete guided weapon and aircraft systems while they are still on the drawing board, the Emiac II analogue computer is the subject of a booklet published by E.M.I. Electronics Ltd. The booklet is well illustrated and as well as description of the computer itself, several typical problems dealt with by Emiac II in the automobile, chemical, structural and aeronautical engineering fields are given.

Reader service reference No. 132

Some typical examples of the uses of Bralloy products are described in **Hot Non-ferrous Pressings,** a brochure from Brass & Alloy Pressings (Deritend) Ltd. The examples given include valve bodies, connecting rods, terminal lugs and a variety of aircraft components.

Specifications of a wide range of mercury switches for industrial use are given in **Mercury Switches of Quality,** a 24-page brochure produced by I.A.C. Ltd. which also marks the completion of 25 years of manufacturing by this company. Although the majority of the range are switches in which contact and rupture of the circuit takes place between mercury surfaces, American type switches, in which the break is between mercury and metallic contacts, are also produced.

Reader service reference No. 133

Training and prospects for apprentices in the Brockhouse Organization are dealt with in a glossy brochure called **Opportunities in Engineering.** Both Craft and Student apprenticeship courses are available, and the company awards two scholarships annually tenable at the University of Birmingham.

Tyglass in Industry—is the title of a handbook on the industrial applications of glass textiles prepared by Fothergill & Harvey Ltd. The handbook opens with an introduction to the many forms of Tyglass available together with their properties and types of weave and construction. Seventy-nine different cloths are listed in the specification guides provided and there is a chapter on the various types of finish available.

Reader service reference No. 134

An illustrated brochure from the Kellett Engineering Co. Ltd. contains data on Thomson Ny-liners, nylon liners for journal bearings. They are designed for fitting into users' own housings but can also be supplied complete with carbon steel outer sleeves. The liners have narrow slots or compensation gaps which allow for dimensional changes due to moisture absorption or temperature change. Internal diameters range from 3/16in. up to 3in.

Reader service reference No. 135

Two new leaflets have been produced by the United Kingdom Atomic Energy Authority on the Hector and Nero reactors at Winfrith. Nero is a zero energy graphite moderated reactor designed for experiments on a wide variety of reactor types and on the nuclear properties of the materials used in reactors. Hector is a hot enriched carbon-moderated thermal oscillator recator designed to make use of the "pile oscillator" technique for evaluating the nuclear behaviour of fuels, moderators and structural materials for reactors.

Reader service reference No. 136

A comprehensive catalogue on Phoenix "Quick Fix" terminals has been published by H. Knumann & Co. of Essen. It is printed in five languages and is available from the British agents, D. J. Equipment (Hersham) Ltd. The terminals are designed to give an easy method of mounting a large number of terminal ways in a comparatively small space. Matching components with capacities of 20-300 amps are clipped on to a common mounting rail.

Reader service reference No. 137

A leaflet from the Dust & Fume Control Division of Tilgman's Ltd., describes the principle of operation of the company's fully automatic filter plants and contains a description of the reverse flow type plant, in which each filter tube in turn is collapsed to deposit the cake of dust in a hopper.

Reader service reference No. 138

FINANCE AND COMMERCE

TRADE AGREEMENTS

CROSS LICENSING DEAL SIGNED BY ANGLO-U.S. FIRMS

CROSS licensing and selling agreements have been made between **Vickers-Armstrongs (Engineers)** and **Racine Hydraulics and Machinery Incorporated,** of Racine, Wisconsin, USA.

The agreement will complement the VSG range of Vickers' oil hydraulic equipment.

Vickers-Armstrongs (Engineers) are to produce the Racine hydraulic equipment at their Weymouth works, handling distribution throughout the British Commonwealth and European countries.

Montgomerie Reid Engineering have taken over **R. H. Corbett & Co.,** of Rochester, Kent. They will now manufacture the complete range of Corbett trucks.

Formal offer

A formal offer by **John Brown & Co.** to acquire the whole issued share capital of **Holmes Homalloy** has been sent out.

The offer, of 7s. 6d. for each 2s. share, is conditional on acceptance by holders of not less than 90 per cent of the shares, or any smaller percentage acceptable to John Brown.

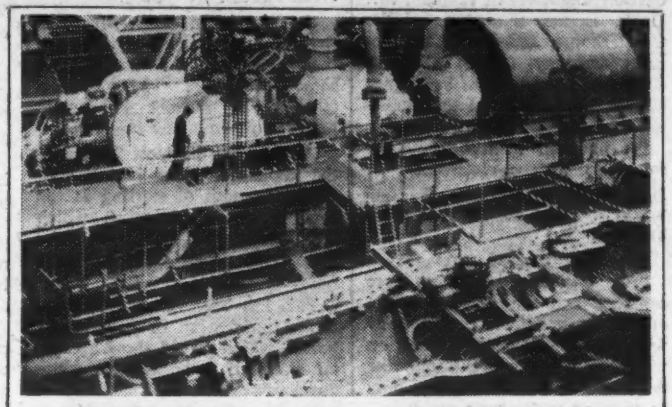
Holmes Homalloy directors have recommended acceptance.

Opportunities for exports

AUSTRALIA: Belt Conveyor Lines, two electrically operated belt conveyor lines 7,300ft. and 8,500ft. long, for recharging brown coal at 2,200 tons per hour from Morwell Open Cut - Hazel wood project. Specifications and drawings from the Agent General for Victoria, Victoria House, Strand, London, W.C.2. Tenders to the Commission in Melbourne by January 30. ESB 32533/61.

SAUDI ARABIA: Power Station for the Dhahran Electric Supply Co., Dammam, Saudi Arabia. Tenders available from the general office Dammam for SRs 500 (S112). Offers by January 15, 1962. ESB 32283/61.

Inquiries should go to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, W.C.1, before dates given. References (ESB) should be quoted.



FIRST OF THREE

The first of three 120-MW turbo-alternator sets being built for the new Richborough, Kent, power station by Richardsons Westgarth (Hartlepool) Ltd., is now being dismantled for transport to the site after completion of shop tests. Generating at 13,800 volts, each set is made up of a three-cylinder reheat turbine and hydrogen-cooled alternator. No. 1 set of the three is shown after shop steaming trials with No. 2 being erected on the test bed.

Q3 fiasco brings hint of hope

DOES the Q3 fiasco contain the hint of any brighter prospects for the shipbuilding industry and its suppliers?

If the decision to go ahead with the Queen Mary replacement had been made the order would have gone to the Vickers-Swan Hunter consortium on the North-East coast.

It is this co-operation between Vickers and Swan Hunter Wigham Richardson that seems likely to lead to future expansions.

The articles of association, a Vickers spokesman told Engineering News, referred to ships of 70,000 tons and over. This seems now to limit the prospects to the tanker world but alterations in the scope of the combined operation could be made easily enough.

The decision to consider a liner of more variable use of around 60,000 tons, based on the Vickers-Swan Hunter proposals, must be read alongside the news of the Cunard company's predicted heavy loss on this year's trading.

Further mergers among the shipping operators, or at least interchange of liners, are much in the air. It may be that the Vickers-Swan Hunter team will be followed by a drawing together of the shipbuilders now that one of their possible defences against a threatening future has been given up, or at least postponed for modification.

Northumbrian aim

The submission of the lowest tender by Vickers-Swan Hunter at least demonstrated the ability of the area to compete openly with other industrial regions.

This comment came from Mr. J. B. Ross, Northumberland Planning Officer: "The government may now be persuaded to give Northumberland the help she requires by designating at least part of the industrial area as a development district.

"Tendering for the Q3 has shown that existing industries in the area are highly efficient and suggests that industrial expansion in the area can be based on sound economic reasoning."

Electricity Council reports improved sales

KITCHEN MARKET PICKS UP

Demand rises for washing machines, refrigerators and cookers

FIGURES released by the Electricity Council show a slight improvement in the home market of the electrical appliance manufacturers, despite the government's economic policy. Sales of appliances by the Area Electricity Boards were better this August than in the same month of last year. In refrigerator sales, one of the industry's sectors with most surplus capacity, there was a sharp rise.

Over all the areas 10,318 refrigerators were sold in August—a 13 per cent improvement on the previous August. Washing machine sales crept up by two per cent to 7,943. This category shows the heaviest fall when the twelve months to the end of August are concerned. The number of washing machines sold in this period was 104,482 a drop of 22 per cent over last year.

Clothes driers fell below the sales of the previous August by 41 per cent, water storage heaters by 14 per cent and wash boilers by seven per cent.

In the twelve months up to the end of August 352,231 cookers were sold, an increase of four per cent.

ENGINEERING CONTRACTS

BAC jet brings £6¼m. order

FIRST export order won by the British Aircraft Corporation's BAC one - eleven short-haul jet is worth £6¼ million. It is from the US Braniff International Airways for six one-elevens with spares.

If the option for another six, with spares, is taken up, the order will rise to £12½ million.

Sir George Edwards, BAC's managing director, has said: "Before long there may be further orders including more from the United States.

☆

Power stations in Amman and Jordanian Jerusalem are to be equipped with four Mirrless/Brush diesel generating sets.

The engines will run on surplus fuel from local refineries saving an estimated £60,000 a year.

☆

Wild-Barfield Electric Furnaces Ltd., of Watford, Herts, are to carry out a repeat order for mains frequency induction heated equipment for Japan.

The equipment will have a nominal capacity of 650 lb molten aluminium. It is to be used for the low pressure diecasting of automobile engine components.

☆

The Central Electricity Generating Board have placed a £150,000 order with Associated Electrical Industries for two 90 MVA transformers. They are to be installed at Meaford substation, in Staffordshire.

Each 90 MVA three - phase 132/33 kV transformer has cooling by natural oil circulation up to half full load and by forced oil circulation and air blast for higher loads.

ISRAEL IS BUYING BRITISH

ISRAEL is to have a new fleet of 235 U.K.-built trucks next year when she takes delivery of £70,000 worth of vehicles from Leyland Motors.

The contracts cover 124 four- and six-wheel chassis for heavy service, powered by 150 h.p. diesel engines, and 111 medium load four-wheelers.

Haulage, tipper and tractor models of the chassis will be distributed to Israeli transport companies by the Consolidated Near East Co.

Nearer home, the Manchester Corporation have ordered bus chassis worth almost £100,000.

SOLARTRON SHOULD DO BETTER IN U.S.

NO major change in the directions of the Solartron Electronic group's development are expected to follow the sale of its interest in the group by Firth Cleveland, the industrial holding company, to Schlumberger Ltd.

Explaining the Solartron point of view to Engineering News an executive said: "If you are thinking of the Schlumberger association with the oil industry the answer is that we are already very much in data logging and data processing.

"We are finding some of our main customers in the big European power stations. Any change in the growth rate is likely to be upwards."

Schlumberger itself recently agreed to merge with Daystrom Inc., one of the big U.S. manufacturers of electronics equipment.

Two conclusions seem evident: Solartron, whose overseas sales efforts have never lacked drive, should get a useful boost in the States;

Firth Cleveland, who received £1.9 million for their 56.7 per cent holding, are now "better placed" to maintain the expansion that has been and will continue to be one of the central features of the group's policy.

Due to the ending of Solartron's bank overdrafts the total improvement in the Firth Cleveland liquidity is about £2.5 million.

Martonair lead in every phase of applied pneumatics
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An unrivalled technical service
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Die-hards and Die-castings

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Important News

Weir · Pacific

pumps

G. & J. Weir Limited, Cathcart, Glasgow have been appointed sole licensees for the manufacture and distribution in the United Kingdom of the well-known centrifugal pumps designed by Pacific Pumps Inc., (A Division of Dresser Industries, Inc.,) Los Angeles, U.S.A.
Good delivery dates can be given for the supply of new equipment together with comprehensive facilities for the maintenance of existing installations.

WEIR—PACIFIC PUMPS
Centrifugal pumps for the petroleum, chemical, process and fluid handling industries.

Weir
G. & J. WEIR LIMITED, Cathcart, Glasgow S.4.
Telephone: Merrylee 7141 (20 lines)
London Office: Dunster House, 37 Mincing Lane, E.C.3.

FINANCE AND COMMERCE

GERMAN ORDER DOUBLED

A SUBSTANTIAL repeat contract from the West German car industry for high quality metal patterns and foundry tooling has been won by International Patternmakers, a British export company.

Contracts in this section of the foundry industry, one of its most skilled, have been carried out for foundries in Sweden, West Germany, Portugal, Switzerland, Israel, and Yugoslavia.

International Patternmakers, based in Darlington, was set up by a group of master craftsmen patternmaking firms, in 1959, in Birmingham, Darlington, Leamington, Leeds, Leicester, and Manchester.

It is believed to be the largest organisation in the world devoted to the export of pattern equipment, dies, foundry tooling, and equipment.

'Finance houses should help the small man'

THE real risk money of the future will be used to finance prototype and development work. One result of this will be that the financial institutions will have to be in a position to assess the quality of technical management.

Making these points in a recent lecture to the Institution of Production Engineers in London, Mr. D. L. Donne, a director of the Charterhouse Industrial Development company, forcast a higher degree of specialisation by finance houses, particularly in the financing of small companies.

"A financial institution set up solely to finance electronics, or plastics, or precision tool-making would be able to provide more than finance.

Specialist age

"As business becomes more complex and we enter the age of the specialist, then somebody will need to be the focal poirft on which can be concentrated the services that otherwise could only be afforded by the large company."

Mr. Donne was delivering the 1961 Sir Alfred Herbert paper, on Finance for Industrial Growth.

Requirements for gaining credit facilities and for accepting payment in "difficult" currencies were a growing problem.

Mr. Donne said the specialised finance house could well be the source of these central management services. This would give the smaller companies some of the advantages or large scale operations without loss of identity.

British delegation to visit Japan

LONDON and Birmingham Chambers of Commerce are jointly sponsoring the first official British trade delegation to visit Japan since the war.

British exports to Japan have risen sharply this year, with machine tools playing an important part.

In the first seven months of the year UK exports to Japan were worth £26.8 million, a 64 per cent improvement over the equivalent months of 1960. The twenty-strong mission will leave London next April.

Talks on Anglo-Japanese trade are currently going on in Tokyo.

For Japan to apply the 90 per cent liberalisation of all her imports, for which the target date is next October, to trade with Britain it may first be necessary for the UK to accord the full terms of the General Agreement on Tariffs and Trade to Japan.

So far these benefits have been withheld from Japanese exports to Britain.

An official of the London Chamber of Commerce told Engineering News: "Japan is now embarking on a sweeping programme of investment in new plant. British industry could make a substantial contribution."

A special point of concern for the visiting trade team will be the swifter start in the field of licensing agreements made by the Americans and by the French and the West Germans.

Stocks rallying despite the business gloom

WEEK IN THE CITY
BY OUR CITY EDITOR

FOR no sound economic reason, stock markets developed a rallying tendency last week, though the improvement was mainly in leading stocks which had suffered heavily in the recent setbacks. The volume of business remains small and the undertone far from robust.

One factor in the recovery is that "bears" have been covering their positions. Another is that some investors have been tempted by current low price levels to make a few purchases.

Perhaps the brightest feature of the economic scene is the continued strength of sterling in the foreign exchange market, which has encouraged the hope that the Bank Rate will soon be reduced again.

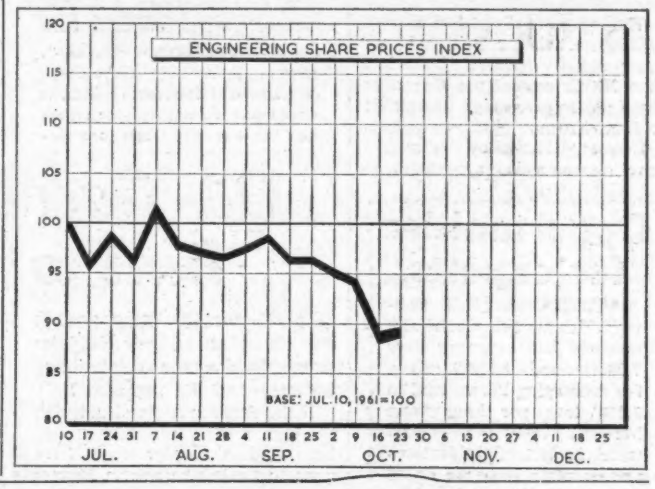
This has been reflected in continued purchasing of government bonds, which would show a capital profit if interest rates come down.

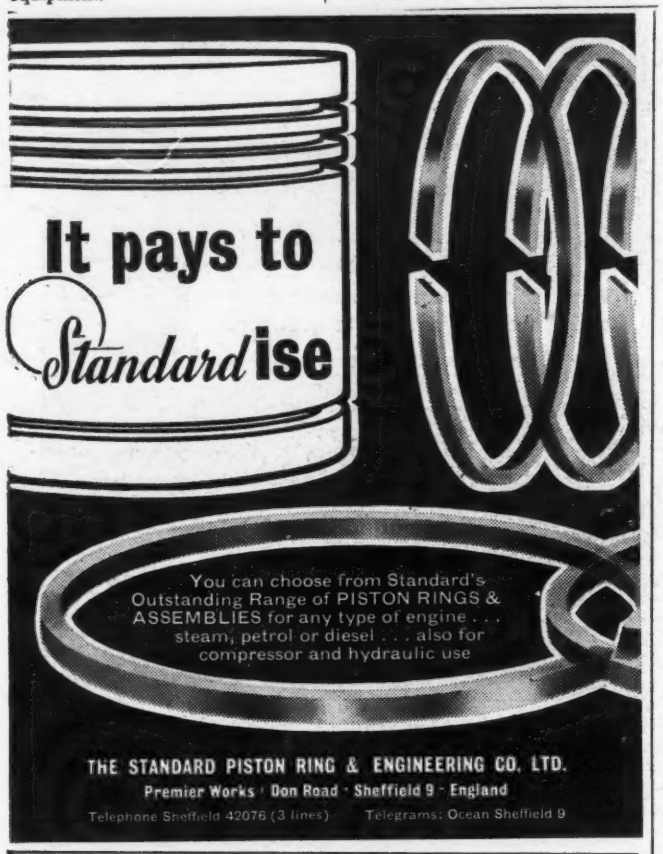
On the company news front, reasonably satisfactory results have been announced by R. and W. Hawthorn Leslie, the Tyneside engineers and shipbuilders.

Group profits have fallen by about 10 per cent, but the dividend is maintained at 25 per cent. for the year, the payment being about three times covered.

The problems of the shipbuilding industry have not been improved by Cunard's decision to shelve the Q3 project, but Hawthorn Leslie has a sound financial record, and heavy profit retentions in recent years will have put the company into a good position.

Hawthorn Leslie yield about 9 per cent and Swan Hunter 7.6 per cent. John Brown give a return of 6.7 per cent. This would probably be higher, but for the group's engineering and machine tool interests.

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BETTER TIMES AHEAD SAYS BEI CHAIRMAN

THE strength of British Electronic Industries—the Pye-E. K. Cole concern—in other activities than domestic television are well illustrated in the annual statement of Mr. Charles O. Stanley, BEI chairman.

Telephone Manufacturing, the company bought last year after a lively take-over struggle, showed a profit of £200,000 from the date of its purchase up to March 31 this year. A substantial increase in profits is anticipated.

Pye Telecommunication, a company with a widely recognised growth potential, is already earning £500,000 a year. The profit from the scientific instrument companies in this year is expected to reach £500,000.

Group profit, before tax, for the year to March 31, was £726,781.

Pye profit

This was made up of a Pye profit which had fallen from £2,423,884 to £1,473,902, and a loss by E. K. Cole of £665,429.

Ekco were heavier hit than Pye because it had a larger stock of sets, and clearing up production to which the firm was committed involved considerably heavier losses.

Mr. Stanley emphasised: "Once the present situation has been cleared, the TV set business of any company in the group will be run at a profit."

NEW Companies

N. C. Brown (London) Ltd. 25 Newton St., Kingsway, W.C.2. To carry on the business of merchants in steel equipment, etc. Nominal capital £5,000.

Haynes Bros. (Wallingfield) Ltd. Industrial Estate, Wallingford, Berks. To carry on the business of electrical engineers, etc. Nominal capital £100.

John Higgins & Co. Ltd. 32 Davenport Ave., Manchester 20. To carry on the business of heating, ventilating and air-conditioning engineers. Nominal capital £2,000.

These particulars are selected from the daily Jordan's Register, published by Jordan & Sons Ltd., 116 Chancery Lane, London, W.C.2.

ENGINEERING NEWS SHARE PRICES TABLE

1961 High	1961 Low	Stock	Oct. 23	Ch'ge	Y'ld p.c.	1961 High	1961 Low	Stock	Oct. 23	Ch'ge	Y'ld p.c.
47/9	31/9	Allen, Edgar (£1)	32/-	–6d.	8.3	57/-	44/9	Lister, R.A. (£1)	49/9	+1/-	5.5
43/-	26/-	Allen, W. H. (£1)	26/-	–1/-	7.4	51/9	36/-	Mather & Platt (£1)	36/-	...	6.0
77/-	58/6	Angus, George (£1)	67/6	+2/6	...	67/-	47/-	Metal Industries (£1)	47/-	–6d.	6.3
31/10½	19/-	A.P.V. (10/)	29/3	...	3.8	71/3	53/4½	Morgan Crucible (£1)	58/9	–1/-	4.7
14/1½	8/10½	Asquith Machine Tool (5/)	10/-	...	2.4	31/-	20/-	Morris, Herbert (10/)	20/3	...	7.8
48/6	29/-	Assoc. Electrical Ind. (£1)	30/6	+1/6	9.7	52/-	37/3	Murex (£1)	37/3	–1/-	6.8
16/5	11/8	Assoc. Engineering (5/)	12/6	+3d.	5.3	49/6	40/6	Neepsend Steel (5/)	43/-	–9d.	5.9
110/-	83/-	Averys (£1)	86/-	+3d.	3.4	31/6	21/9	Newton Chambers (5/)	21/9	–1/3	4.5
36/9	20/-	Babcock & Wilcox (£1)	21/6	+1/6	...	41/3	21/3	Parkinson Cowan (£1)	21/3	–1/3	6.8
59/6	40/6	Baker Perkins (£1)	44/6	–6d.	5.0	72/9	47/-	Parsons, C. A. (£1)	49/6	+2/-	5.0
9/7½	5/10½d.	Beyer Peacock (5/)	6/3	...	9.2	40/3	38/-	Plessey (10/)	40/-	+1/-	3.7
77/-	45/-	Birfield (£1)	61/6	–6d.	3.2	33/-	16/-	Pressed Steel (5/)	17/7½	+1/7½	8.4
102/10½	68/3	Birmid Industries (£1)	69/3	+1/-	5.7	25/3	20/-	Qualcast (5/)	20/3	+3d.	4.4
36/10½	19/6	Birmingham Small Arms (10/)	19/6	–1½d.	5.9	38/1½	22/9	Radiation (£1)	22/9	+3d.	8.7
45/6	33/6	Brockhouse, James (£1)	34/3	+9d.	7.2	22/6	14/-	Ransome & Marles (5/)	15/-	–6d.	4.5
28/9	22/2	Broom & Wade (5/)	24/-	–1/6	4.6	28/6	22/6	Ransomes, Sims & Jeffs (£1)	23/6	–1/6	6.4
42/6	32/-	Brotherhood, Peter (10/)	32/-	–1/9	7.5	50/6	34/6	Renold Chains (£1)	39/6	–6d.	5.0
48/9	33/-	Brown, John (£1)	32/-	–1/3	6.7	52/3	38/-	Reyrolle, A. (£1)	39/-	+1/-	4.9
8/6	4/9	Cammell Laird (5/)	4/9	...	...	9/1½	4/3	Richardsons Westgarth (10/)	4/4½	–1½d.	...
39/6	29/3	Carrier Engineering (5/)	31/3	...	3.9	9/3	4/10½	Roberts, Charles (5/)	4/10½	–4½d.	...
54/3	36/6	Clarke Chapman (£1)	40/3	...	6.7	48/6	40/6	Rolls-Royce (£1)	40/6	...	5.4
14/9	9/9	Cohen, George (5/)	9/9	...	6.3	32/6	20/-	Ruston & Hornsby (£1)	20/-	–1/6	8.7
33/10½	21/8	Coventry Gauge & Tool (10/)	29/7½	...	4.0	19/3	14/-	Serck (5/)	14/3	+3d.	4.4
12/3	7/3	Craven Brothers (5/)	7/3	–3d.	5.6	23/9	12/7½	Shaw, Francis (4/)	13/10½	–4½d.	5.6
24/-	17/6	Crofts Engineers (5/)	18/9	–6d.	4.4	12/-	8/9	Sheepbridge Engrg. (5/)	9/-	–¾d.	7.9
39/7½	32/-	Davy-Ashmore (5/)	32/-	–2/-	4.2	32/4½	19/1½	Simms Motor (5/)	21/6	–9d.	3.9
70/-	47/-	De La Rue (10/)	47/-	–1/6	4.7	44/1½	29/7½	Simon Engineering (5/)	34/10½	–7½d.	3.9
27/7½	19/9	Delta Metal (5/)	20/-	–3d.	4.9	23/9	13/9	Smith, S. & Sons (4/)	13/9	–4½d.	5.7
68/9	50/-	Desoutter (5/)	53/6	–1/6	3.1	15/3	11/10½	Solar Industries (5/)	11/10½	–1½d.	7.2
41/3	31/9	Dowty Group (10/)	33/3	–7½d.	4.6	45/7½	25/6	Staveley Industries (£1)	25/6	–2/6	8.4
32/10½	22/4½	Edwards High Vacuum (4/)	30/3	...	1.9	32/6	18/6	Steel & Co. (5/)	27/10½	...	4.0
52/-	36/-	Elec. & Musical Ind. (10/)	37/6	+1/-	4.6	67/-	48/-	Stone-Platt Ind. (£1)	48/-	–1/-	6.6
38/-	25/9	Elliott-Automation (5/)	35/3	+1/3	1.8	20/4½	14/-	Tecalemit (5/)	14/3	+3d.	6.2
40/6	26/3	English Electric (£1)	28/9	+2/6	6.9	17/4½	12/7½	Thompson, John (5/)	13/-	+4½d.	1.9
37/3	25/4½	Firth Cleveland (4/)	25/4½	–3/1½	5.0	7/-	4/9	Thornycroft, John (4/)	5/-	...	...
39/6	24/3	G.E.C. (£1)	25/3	+1/-	8.1	17/6	11/6	Toledo Woodhead (4/)	14/7½	–1½d.	5.3
65/-	42/9	General Refractories (10/)	49/6	–1/3	4.9	85/6	55/-	Tube Investments (£1)	58/-	+3/-	4.8
66/6	50/7½	Glenfield & Kennedy (£1)	50/7½	–1/3	8.0	38/4½	26/9	Vickers (£1)	26/9	–3d.	7.4
108/7½	78/6	Guest, Keen & Nettlefold (£1)	80/3	+9d.	3.9	157/6	122/6	Walmsley (Bury) (£1)	135/-	+6/3	3.2
48/7½	26/6	Haden, G. N. (5/)	27/-	+6d.	3.6	84/6	64/6	Ward, Thos. W. (£1)	67/6	–6d.	4.1
16/6	12/1½	Hall-Thermotank (5/)	12/1½	–3d.	4.5	17/9	12/3	Weir, G & J. (5/)	12/7½	+4½d.	6.9
24/-	15/6	Harland & Wolff (£1)	17/-	...	5.8	47/6	30/3	Wellman Smith Owen (5/)	30/3	–10½d.	3.5
33/3	27/3	Hawker Siddeley (£1)	27/4½	+1½d.	7.7	14/1½	10/3	West, Allen (5/-)	10/3	...	6.4
31/-	20/9	Head Wrightson (5/)	20/9	–10½d.	3.7	46/3	25/6	Westinghouse Brake (£1)	25/6	...	8.5
79/9	51/6	Herbert, Alfred (£1)	61/-	+4½d.	4.5	36/6	19/-	Wheelco (5/)	19/-	–6d.	7.0
95/6	75/-	Hick Hargreaves (£1)	75/-	–2/6	5.3	17/-	12/-	Wilmot-Breeden (5/)	13/3	–3d.	4.2
138/9	101/3	Hopkinsons (£1)	116/3	–3/9	4.7	30/-	20/-	Woodall-Duckham (5/)	20/6	...	5.0
25/-	18/6	Howden, James (5/)	21/-	...	5.8	64/9	44/6	Worthington-Simpson (10/)	49/-	–1/-	5.9
33/9	23/-	International Combus (5/)	23/-	...	6.4						

IRON AND STEEL

43/6	25/7½	Brown Bayley (10/)	34/-	...	4.6	42/-	25/1½	South Durham Steel (£1)	25/1½	...	9.4
81/3	49/-	Colvilles (£1)	50/-	+1/-	6.3	47/8½d.	32/4½	Steel Co. of Wales (£1)	34/10½	+2/6	7.1
32/3	21/10½	Consett Iron (£1)	21/10½	...	8.5	57/4½	40/7½	Stewarts & Lloyds (£1)	41/7½	+1/-	7.1
43/7½	26/10½	Dorman Long (£1)	27/7½	+10½d.	7.1	68/7½	42/1½	John Summers (£1)	42/10½	+9d.	6.9
55/1½	38/1½	Firth & Brown (£1)	38/1½	–1/-	6.3	55/7½	38/-	United Steel Cos. (£1)	40/10½	+1/3	5.9
49/10½	31/1½	Lancashire Steel (£1)	31/10½	+9d.	6.8	63/6	46/-	Whitehead Iron & Steel (£1)	46/-	...	6.4

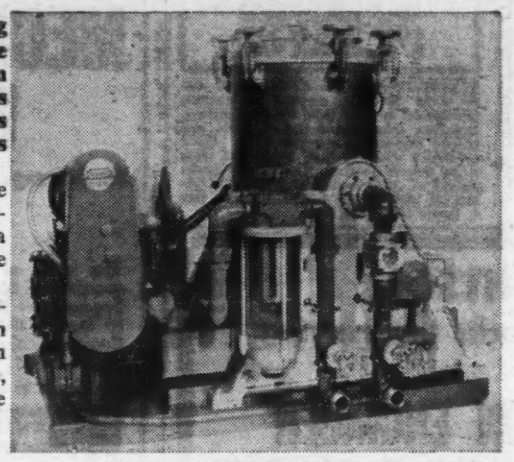
The companies whose share prices are quoted in the Engineering table and which form the basis of the Index give a balanced and comprehensive study of the engineering industry. Prices quoted are those at the start of the week. Due adjustments for Rights and Scrip issues are made. The Index figure is calculated on a National Cash Register Company computer. Prices in the Iron and Steel sections are not included in the Index.

'Quality not quantity makes 14th EIA Exhibition interesting'—Lord Brabazon

OPENING the three-day 14th Engineering Industries Association Exhibition at the Royal Horticultural Society New Hall in London, Lord Brabazon commented that this exhibition was interesting not because of its size but due to the quality and range of its exhibits.

Although the organisers reported little response to their request to exhibitors for advance information of new products there was, in fact, a number of interesting new developments to be seen.

A useful method of spraying large components with a 100 per cent. P.V.C. coating has been evolved by the Plastic Dipping Co. Ltd. This can be done on-site and can be applied, for example, to large ventilating fans and ducts which operate in a corrosive or harmful atmosphere.



Self-contained multi-purpose Filter Unit, one of the largest in a range supplied by Par-Tool Filters, Luton.

This firm has also finalized development on the spraying of vinyl acetate copolymer on wood. This new process should be on the market in the near future and the decoration and protection of wood by a thin, strong plastic film suggests many possible applications.

A manually operated hydraulic vice which can exert considerable force to hold a workpiece was shown for the first time at the Euco Tools Ltd. stand.

This is a standard 6in. machine vice. Its moving jaws incorporate a hydraulic circuit.

Final tightening is effected by turning an actuating screw which is on a ratchet.

This is an improvement on the usual "ruin the vice" method in which final tightening is accomplished by using a lead hammer.

Considerable pressure can be applied to the jaw piece with little effort to the actuating screw in which the mechanical advantage of the hydraulic circuit is in the ratio of 16 to 1.

Two new pieces of apparatus concerning the optical field were presented.

True 3-D image

A stereoscopic projector designed by Vision Engineering Ltd., Woking, was shown for the first time. This produces a magnified true three dimensional image on a flat glass surface of components under inspection.

The usual stereoscopic binocular microscopes necessitate close concentration with both eyes, the positioning of the head is critical, and the field of view comparatively small.

Overcoming these disadvantages this new instrument, the Stereoscope, provides a true stereoscopic image in colour with a good depth of focus.

The standard instrument is supplied complete with 7½ times magnification objective, twin illuminators with lamps, heat filters and tripod for bench mounting.

It is claimed to be a major advance in inspection and miniature assembly techniques by the makers, and an ultra high definition model sells at £80.

A measuring projector, the Shadomaster Model B.C.1512, was shown in London for the first time by Watson, Manasty & Co., Teddington.

Optical projector

This is an accurate optical projector specially designed for repetition gauging applications on mass produced components.

The instrument can be mounted on a bench or table and is provided with a ground surface on the top of the base casting for the mounting of gauging blocks or fixtures.

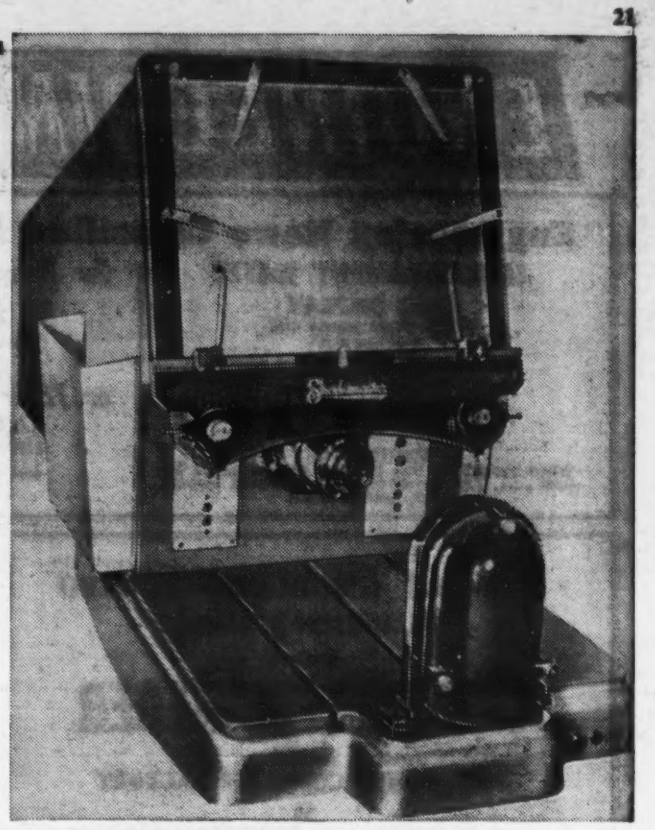
A chart rest in front of the ground glass screen is provided with adjustments for aligning a drawing to the projected image.

A highly accurate optical system is incorporated and the machine is of rigid construction suited for use in a production workshop.

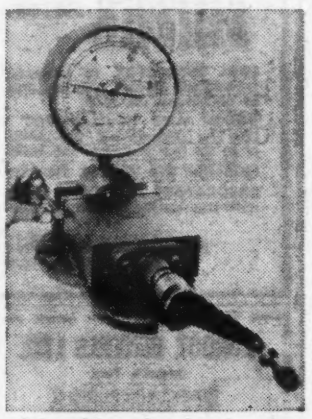
Among new products introduced earlier in the year was a Verdict OB Electronic Gauge developed to satisfy the ever-increasing demand for accuracies of better than .00005in. without elaborate mountings or special conditions.

Readings are made on a meter having a 3.4in. scale length which is calibrated to read ±.001in. in divisions of .00005in., and a second range of ±.0002in. in divisions of .00002in.

These ranges can be extended by the use of different length probes which form part of a lever that transmits movement of a contact ball to a non-ferrous inductive transducer to give the required gauge reading.



The Shadowmaster Model BC 1512 Optical Projector.



A machine vice incorporating the Euco Hydraulic System.

CEMENT WORKS IS READY

A NEW cement works with production capacity of nearly a quarter-million tons per annum was recently completed at Plymstock for the Associated Portland Cement Manufacturers.

The Plymstock plant operates from start to finish on a dry system and should show a saving of one-third in fuel expenditure. On average plants this is usually 30 per cent of the final manufacturing cost.

A feature of the works is the introduction of the Humboldt process, used for the first time in this country.

This process, housed in the ten-storey building, operates on a system of cyclones. These pre-heat the raw materials to a temperature of 1,400°F before passing to the 178ft. long rotary kiln.

Dust free

Cement production by this method is dust-free and offers protection against pollution of the atmosphere.

The grinding mill is sited on the ground floor of the Humboldt building. Here a mix consisting of crushed limestone, shale and silica sand is ground and dried before passing to the blending silos.

The mill revolves at 17 r.p.m. and has a guaranteed output of 55 tons per hour.

Plymstock is one of the few places in the West Country where limestone and shale appear at the surface in correct proportions. At current rate of production, it is estimated that these deposits will last for 60 years.

Pneumatic throttle

DUNLOP have introduced a new concept of speed control which eliminates the complicated accelerator-carburettor linkage problems associated with modern cars. The system is to be seen at the Earls Court Motor Show.

This throttle control is pneumatic and uses air to transmit the driver's foot movements.

Depression of the pedal forces air through plastic tubing into a rolling diaphragm actuator connected to the carburettor.

As the Dunlop unit is free from friction, it assures motorists more positive control throughout the whole range of throttle openings.

Third symposium on MHD engineering

THE Third Symposium on Engineering Aspects of Magneto-hydrodynamics is to be held at the University of Rochester, New York, on March 28 and 29 next year.

This meeting is being sponsored by A.I.E.E., I.A.S., I.R.E., and the University of Rochester. It is planned that the programme shall be concerned with plasmas in the presence of a magnetic field and, in particular, with their engineering aspects.

Main purpose

As at the previous symposia, the primary purpose of the meeting is to exchange information among related disciplines on the assumption that the participants will have some degree of competence in one or more broad areas.

Each session will have both invited and contributed papers. Authors of papers will assume the familiarity of the audience with their field, and concentrate on what is new and original in their particular contribution.

Four planned

Four non-concurrent sessions are planned. It is intended that the communications and diagnostics session will deal with the transmission and receiving of information or energy from plasmas under various conditions; the flight applications session will deal with the propulsion or control of aerodynamic or space vehicles; the fusion session will be concerned with the extraction of energy through controlled thermonuclear fusion of light nuclei; and the power conversion session will deal with the direct extraction of electrical energy from hot flowing plasmas or conducting liquids.

WORLD STANDARDS

OF particular interest to the metallurgist and all manufacturers and users of copper alloy ingots, copper and copper alloy castings is the recently published revision of BS 1400: 1961, the British Standard Schedule for these materials.

The schedule introduces specifications for high-conductivity coppers HCC 1 and HCC 2 and new alloys PB 4 (phosphor bronze); LB 4 and LB 5 (leaded bronze); G 3 (nickel gunmetal); SCB 4 and SCB 5 (naval brass for sand castings and brass for brazeable castings); CMA 1 and CMA 2 (copper-manganese-aluminium) and DCB 3 (brass for die casting).

Three of these arise from an extension of the range of brasses previously designated "B" and its sub-division into sand cast brasses (designated "SCB") and die cast brasses (designated "BCB"). The one omission from the schedule being the previously known alloy SB 1.

Readers will find the "Summary Table", covering 36 alloys of great value. This table gives values of tensile strength, elongation and permanent set stress for each alloy whether sand cast, chill cast or continuously cast.

Also included are the corresponding obsolete BS numbers for alloys where appropriate and details of the accepted "colour code for ingots".

Divided into three sections the schedule includes requirements relating to freedom from defects, provision of test samples, mechanical and chemical tests, retests, inspection and testing facilities, for both ingots and castings.

The third section gives the complete chemical composition and mechanical properties for both ingots and castings for each material.

The method to be employed for providing test samples is also included.

Separate samples

The schedule draws attention to the need to provide separately cast test samples from the remelted ingot in sand except for alloys DCB 1, DCB 2 and DCB 3, and other ingots ordered for die casting purposes, when chill moulds shall be used.

The appendices contain information relating to dimensions of tensile test pieces and permanent set stress, details of colours to be used for identifying ingots and information to be given with inquiries and orders by the purchaser.

Engineers' Guild: steady progress

ENGINEERING, as an art or science, is well served by divers Institutions, but engineers, as professional people, have been slow to organise themselves on the basis of their common interests.

Recently, more and more has been heard about the activities of the one body devoted to the unity, public usefulness, interests and honour" of all professional engineers.

In a burst of activity this year, the Engineers' Guild has shown what sort of unity has emerged from its years of gradual growth.

In January, it published the results of its second survey of the salaries of professional engineers.

This was a particularly useful piece of work, as there is no other source of information on this subject, and an indication of the trend since the first survey (in which the Guild co-operated with a Royal Commission) was badly needed.

The results of the survey will provide many people and organisations with data for discussion and action, but the Guild's own comments and conclusions gave a balanced and responsible lead.

Need to focus

In March, the Guild organised a National Conference on the employment of professional engineers.

This unique occasion stimulated some progressive papers and speeches about the function of engineers in society, and the relation between technological expertise and management.

The need to focus attention on these subjects was well brought out by the Guild's president, Sir Hugh Beaver, and in a characteristically vigorous address by Lord Chandos.

The proceedings, which include thoughtful papers by some of the most distinguished leaders in industry and applied science, have recently been published in full.

In April, the Guild's secretary visited East and West Africa, to study the problems facing British engineers in African countries nearing independence.

As a result of this, constructive proposals were put forward in a letter to "The Times", and a potentially valuable link was initiated between the newly formed Department of Technical Co-operation and the engineers overseas on whom technical co-operation will ultimately depend.

Membership of the Guild has climbed to over 5,000, and if the rate of recruitment can be increased still further, there is no doubt that the Guild can play an increasingly important part in the world.

So far, the members have been working and paying in faith and hope, but the results are now beginning to show.

Ceramic valve

AN important new type of valve for industrial radio-frequency heating applications has been introduced by Standard Telephones and Cables. The valve is available in forced air, vapour, and water cooled versions.

It is a power triode with an all-ceramic envelope which permits operation at much higher frequencies. Ceramic valves may be operated at full rated voltage up to 100 mc/s.

Space cells

NON-MAGNETIC sealed silver-cadmium cells, developed by the Yardney Electric Corp., U.S.A., are now receiving their first operation tests in the Explorer XII satellite.

These cells operate at considerably higher charging rates and depths of discharge than was previously practicable in solar-energy battery systems.

The new development provides three times more power than ordinary lead-acid or nickel-cadmium batteries, and can be produced to one-third their size.

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The factory is already well established and is currently producing a wide range of prestressed concrete units. This appointment is necessary to ensure the co-ordination of all departments for the next stage in development, i.e to double the present turnover.

Salary and conditions will be agreed at interview with the Managing Director—applicants please apply in confidence to him, marking the envelope "General Manager".

DOW-MAC originated and still lead the manufacture of prestressed concrete in the United Kingdom.

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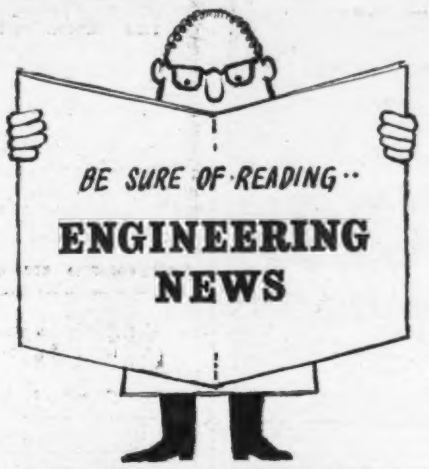

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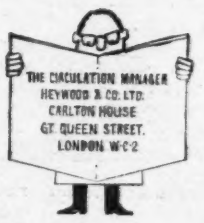

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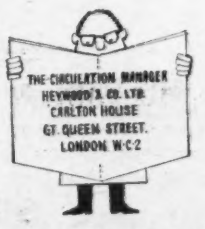

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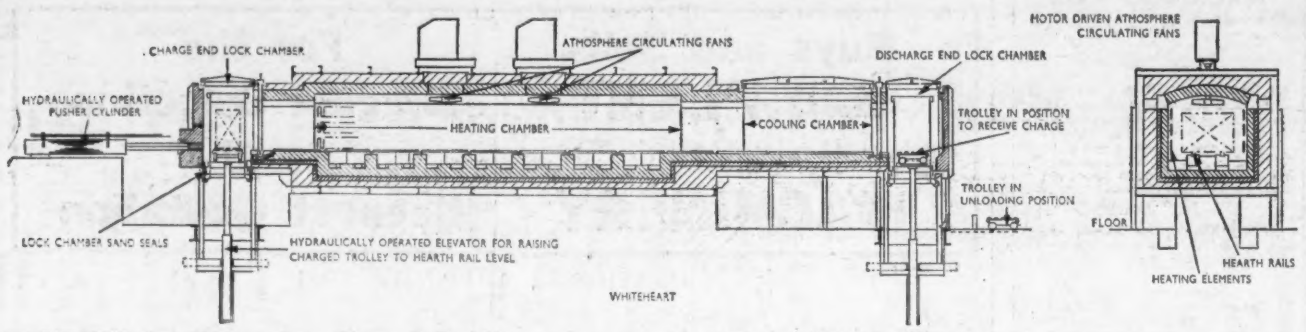
BERYLLIUM MISSILE STRUCTURES

BRITAIN'S FIRST 100-TON CONTINUOUS FURNACE



BRITAIN'S first 100-ton-per month continuous furnace for annealing white heart malleable iron has proved itself at Bullers, of Tipton, Staffordshire.

Orders have been received by the manufacturers, A.E.I.-Birlec, from abroad for similar furnaces with outputs of 150 tons and 200 tons per month.

The 100-ton furnace is electrically heated (gas-firing is optional). It comprises an entrance lock chamber with hydraulically operated elevator for bringing the charge trolley to half level.

The heating chamber, cooling section, and exit lock chamber are at the charge end. Gas tightness is maintained throughout.

Trays, on guide rails, are loaded at set intervals by a hydraulic pusher.

Humid air

All controls are manual but there is a warning time device. A flow of humid air, produced by an electrically controlled water heater, is maintained in the chamber.

Uniform decarburising of the castings is ensured by two fans in the heating chamber and atmosphere composition is indicated by a CO_2 recorder.

The furnace is rated at 250 kW, and the heating elements are zoned on the wall of the chamber into three sections.

Elements are of nickel chromium tape supported by replaceable pins.

Chevron cutting saves cost

HOW research into the machining of beryllium has brought about reduced costs for missile structures was described by technicians of the Lockheed Missiles and Space Co., to the international conference of the Institute of Metals, held in London last week.

The demands of the space age have increased interest in this metal. Beryllium's modulus of elasticity, low density, high temperature strength and specific heat, together with good thermal conductivity, are important in this particular sphere.

A four-year programme was initiated which resulted in successful applications being developed for the Polaris missiles.

In the past, structural applications of beryllium have been prohibited by the material's high cost.

Improved quality

By better process control and screening, the structural quality has been improved. These quality controls produced hot pressed blocks with tensile strengths of 40,000 lb./sq. in. and yield stresses of 30,000 lb./sq. in. It was then necessary to prove that components could be machined from such blocks.

Results were not good, since more than 90 per cent of the material was wasted as chips. To improve the yield a process known as "chevron" cutting was developed by the Brush Beryllium Co. This was a method whereby a stack of parts were machined from a single block.

Apart from this, investigations into hot pressing were undertaken, together with brazing, welding and bonding.

It is anticipated that future applications for high speed aircraft will include wing leading edges and secondary skins, fuselage plating and control surfaces.

Carborundum production up by 40 p.c.

WITH expert planning and flow-line production aids, The Carborundum Co. of Trafford Park, Manchester, have produced outstanding changes in the company's manufacturing processes.

This has been achieved in twelve months. A company spokesman told Engineering News that, as a result, output has increased by 40 per cent, average time for manufacture of abrasive products has been cut by 50 per cent and earnings have risen on an average by 20 per cent.

Enthusiastic co-operation was given by supervisors and operatives in helping to implement new procedures — men and women who for years had been solely concerned with producing goods, joined in the search for a "better way".

LATE NEWS

TEMple Bar 3422

ELECTRIC motors and control gear to be used in plant for the manufacture of Polythene in four Eastern European countries is to be supplied by Laurence, Scott & Electromotors, of Norwich and Manchester. Simon-Carves are the main contractors for the production machinery. Imperial Chemical Industries are providing the technical knowledge of Polythene manufacture by the high-pressure system.

Continued from front page

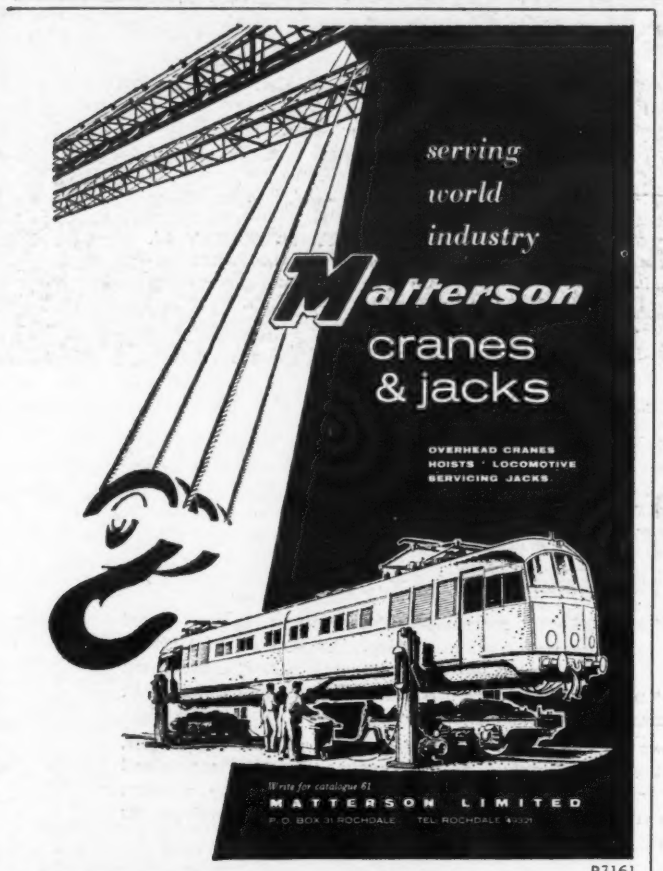
POWER-SAVE DRIVE

It is hoped that data obtained will provide a formula applicable to varying buildings in any expected conditions. Success is dependent on meticulous observations which Miss M. V. Griffith, head of the Heat Section, and her team will be making over the next three years.

The final outcome of the study may be that, through the co-operation of the Meteorological Office and the G.P.O., a code can be fed daily to offices and factories which will ensure continuous comfort with economy of electricity.

WIDER MEMBERSHIP

THE Association of Bronze and Brassfounders have decided, in order to widen the influence of the association, that membership will be available to suppliers to the foundry trade and others whose membership would benefit the association. The Secretary's office is at 69 Harborne Road, Edgbaston, Birmingham 15.



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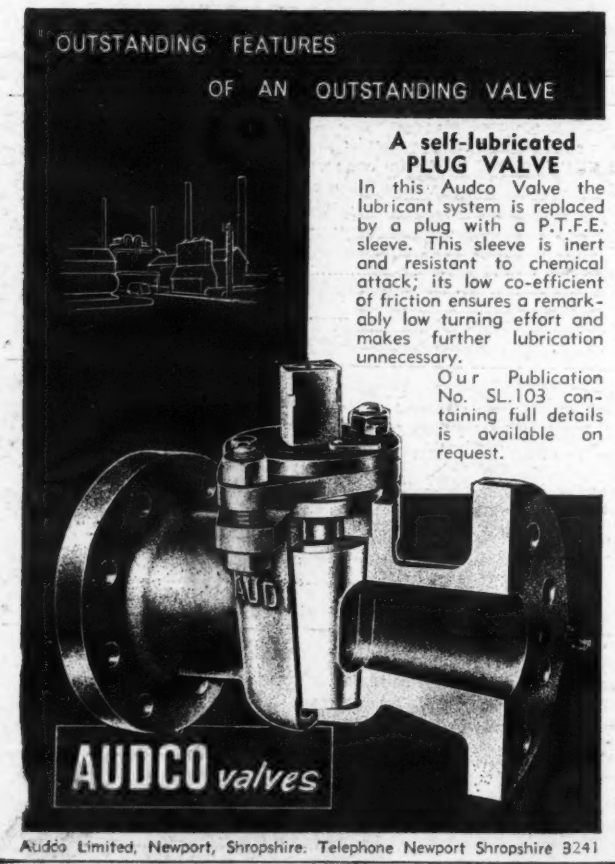
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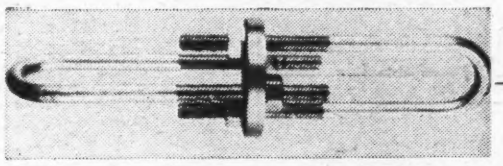

MILAN FIRM PATENT TURNBUCKLE

A SIMPLE type of turnbuckle has been developed by Officine Vidali, of Milan, Italy, an old-established concern specialising in metal ropes and accessories.

Known as the Vidali "MIM", this device is a stretcher incorporating two U-shaped shackles with threaded ends, which can be tightened in opposition against a circular drilled plate. The sizes given range from 3/16in. to 1in. in nine different types.

Today, considerable use is made of turnbuckles for overhead electric cables, and the Vidali "MIM" types are being adopted by several of the largest Italian electric power concerns.

Patents for this new device are pending in most nations, and thorough tests have been carried out by the Milan Polytechnic Institute, with excellent results.

EXPLOSIVE RIVETS

A tubular rivet with an explosive capsule in the tail is the basis of a French process for rivetting from one side.

The producers are Soframic of Paris.

Heat is applied to the head. The capsule explodes and the stem swells to fit the hole. The only tool needed is a hot iron.

New T.V. batteries

SEALED 12-volt rechargeable batteries that will work in any position and which can not be overcharged are being marketed in the U.K. for the first time.

Developed for portable television sets, the batteries are available with either four amp-hour or six amp-hour capacities. They are guaranteed for one year or a minimum of 300 recharges, whichever is the less.

Mains charged

Each battery, four amp-hour and six amp-hour, can supply two-amp and three-amp outputs respectively for five hours of continous use. When the portable set is plugged into the household mains supply, the batteries are automatically recharged via circuitry in the set.

The batteries are manufactured in Germany by DEAC, and the sole agents for the United Kingdoc are G. A. Stanley Palmer & Co. Ltd., Maxwell House, Arundel Street, London, W.C.2.

Positive hydraulic drives providing smooth stepless speed variation over 27/1 range with sensitive accurate control at all output speeds. Carter Gears are made in eleven sizes for variable speed drives from fractional up to forty horsepower. Speed control setting adjustments may be made with the drive either running or stationary by remote electrical, lever or handwheel controls (all available as standard) and many forms of pneumatic, etc., control systems may also be used.

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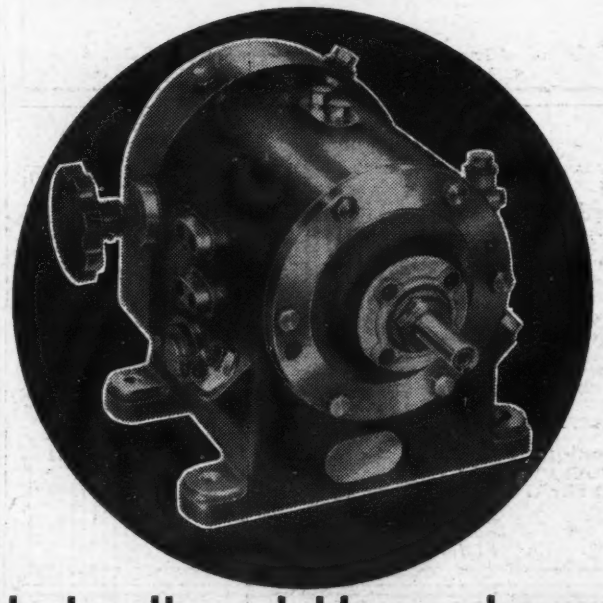

hydraulic variable speed gears

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